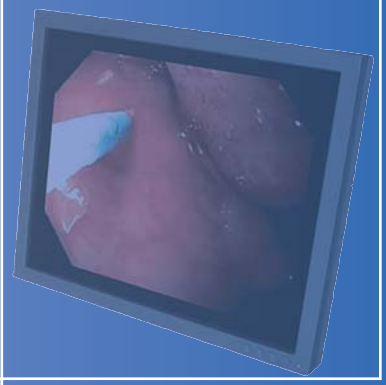
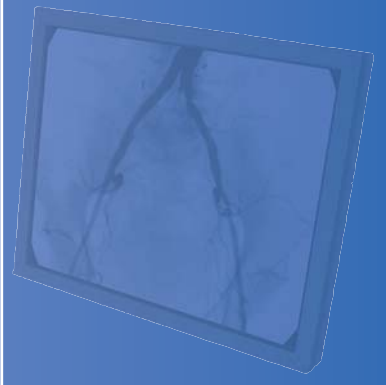
Instruction Manual • 02/2009



High End 19" Color and Gray Scale Flat Panel Display

SCD 19102
SMD 19102



display SOLUTIONS

EIZO

LC displays for medical applications

High-End 19" Color and Gray Scale Flat Panel Display SCD 19102 / SMD 19102

Instruction Manual

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02/2009
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Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠DANGER
indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠WARNING
indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠CAUTION
with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.

CAUTION
without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.

NOTICE
indicates that an unintended result or situation can occur if the corresponding information is not taken into account.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The device/system may only be set up and used in conjunction with this documentation. Commissioning and operation of a device/system may only be performed by **qualified personnel**. Within the context of the safety notes in this documentation qualified persons are defined as persons who are authorized to commission, ground and label devices, systems and circuits in accordance with established safety practices and standards.

Proper use of EIZO products

Note the following:

⚠WARNING
EIZO products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by EIZO. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be adhered to. The information in the relevant documentation must be observed.

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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℗ 02/2009

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Introduction 1

1.1 Contents of this document

This document explains the functionality and the approved application of the:

- SCD 19102 high-end color flat panel display
- SMD 19102 high-end gray scale flat panel display

To ensure clarity, it does not contain all detailed information on this product.

The contents of this document are neither part of a previous or existing agreement, commitment or legal relationship, nor does it modify such.

The displays are available in color and monochrome variants:

Color flat panel display

- SCD 19102 C, version without protective front pane, without multi-functional stand
- SCD 19102 CP, version with protective front pane, IPx2 at front
- SCD 19102 D, version without protective front pane, with multi-functional stand

Gray scale flat panel display

- SMD 19102 C, version without protective front pane, without multi-functional stand
- SMD 19102 CP, version with protective front pane, IPx2 at front
- SMD 19102 D, version without protective front pane, with multi-functional stand

1.2 Further documentation

More information

These instructions are available on the supplied CD-ROM and on the Internet page of EIZO GmbH Display Technologies: http://www.eizo.eu

SMfit® Total Care

Brief instructions for the software "SMfit® Total Care". The context-sensitive help is integrated in the software.

1.3 Program for changing the display settings

SMfit® Total Care

The SMfit® Total Care program is a web-based application and is included in the software and documentation CD shipped with each display. The software is also available as a free download on the EIZO Display Technologies website.

The SMfit® Total Care software also has extensive calibration functions. To use these, you will need a photometer and an activation code. The activation code can be purchased from the EIZO GmbH.

Additional information may be contained in a Readme.txt file on the installation CD.

SMfit® Site Manager

SMfit® Site Manager is a web-based application. It is fully compatible with SMfit® Total Care.

SMfit® Site Manager permits remote access to displays accessible via the network, allowing centralized control from a single computer.

All data are saved in a central customer database and can be called up over the Internet and Intranet.

Additional information about this software package is available on the EIZO Display Technologies website.

See also

Internet (http://www.eizo.eu)

Safety notes

2

Guarantee perfect operation - even in the medical sector

Please note that LC displays such as the SCD / SMD 19102 do not exhibit a zero error rate and that the image parameters can change over time (e.g. color density or distortion/fading of colors). Please ensure that all necessary steps are taken to avoid violations or incorrect diagnoses. Regular maintenance and calibration are recommended.

2.1 General safety notes

Flawless, safe and reliable operation of the equipment assumes that it has been professionally transported, stored, mounted and installed as well as careful operator control and service. The units may only be used for applications for which monitors are normally used.

For safety reasons, the following precautions must be observed:

⚠ DANGER

There is a danger to life if warnings are not obeyed. Severe personal injury or damage to property may occur. Please observe all warning information present on the display and in the user manual.

Do not open the display

The display may only be opened by trained and qualified personnel. There is risk of an electric shock.

Components inside the displays are at high voltage. **Touching these components is extremely dangerous!**

Servicing and maintenance must be carried out by qualified personnel only.

No liability is accepted for damage to property or injury to persons if the display is opened by non-qualified personnel.

Never use defective power cables

A damaged power cable may result in fire or electric shock. Only use power cables approved by the manufacturer.

When disconnecting the power supply cable, always do so by holding the plug. Ensure that your hands are dry.

Route the cable such that it cannot be tripped over.

Do not insert any objects into the housing

Objects inserted into the housing may result in damage to the unit or personal injury.

Do not place any objects on top of the unit

Liquid entering the unit may result in fire or electric shock.

Connecting

There must be no contact to a patient when handling the connection cables.

Overload

Do not connect too many devices to one socket or extension cable since this could result in a fire or electric shock.

Observe the information provided by the manufacturer.

CAUTION

Improper installation may result in extensive damage to property.

Installation must be carried out by specialists.

1. To avoid danger for patients and users, connect your electrical system in accordance with the safety requirements of EN 60601-1-1 (IEC 60601-1-1) "Safety requirements for medical electrical systems".

   In order to guarantee that the housing discharge current in the event of a first fault does not exceed 500 µA, the display must be connected to an additional PE connection. The bracket of the display's support mechanism has its own grounding (PE conductor). This grounding together with the PE conductor of the display means that the housing discharge current always remains less than 500 µA, even in the event of a first fault. The PE conductors of the display and of the separate PC are considered as a first fault event.
2. Use appropriate measures to ensure that the leakage currents in particular remain below the necessary limits:

   Appropriate measures include:
   - Separators for signal input or signal output unit
   - Use of a safety isolating transformer
   - Use of the additional protective conductor terminal
3. Device and patient must never be touched simultaneously.
4. It must be specifically mentioned that the display is only suitable for a patient environment, but not for contact with a patient.
5. Only use video cables with BNC connectors and interface cables which are specified by the manufacturer.

   The serial interface cable must have a female Sub-D connector at the computer end.
6. Use power cables with PE contacts. Only plug the device into sockets with protective grounding.
7. For certain applications, the video ground can be connected separately to the PE via the additional PE conductor in the connection panel. **Observe EN 60601-1-1 (IEC 60601-1-1)**.
8. Close the connection panel using the cover provided, and secure with the screws.
9. **Note for users:**

   The closed connection panel may only be opened by trained and qualified personnel.
10. **Servicing information:**

    If housing parts have to be removed for servicing, this must not be carried out in the presence of the patient or user. Only connect displays with a VESA connection on the rear panel to the power supply when the VESA plate is screwed on.
11. **Important:**

    Note that displays can fail and that the image properties such as brightness, contrast or color location can change with time.

Please ensure that all steps are taken to avoid injuries or incorrect diagnoses. Regular maintenance and calibration must be carried out e.g. with SMfit® Total Care. Observe all regulations of the country in which the display is used.

CAUTION

Failure to observe warnings may result in substantial damage to property

Ensure sufficient heat dissipation

Ventilation slots are provided on the housing base, the top of the cover, the rear panel and the side panels. The permissible ambient temperature range (see manual) must not be violated.

- Installation on a desk:

  Place the display on a hard, level surface at least 10 cm from the wall and 15 cm away from other devices.
- For ceiling suspension:

  Distance from wall at least 10 cm. Several displays can be mounted horizontally or vertically and directly adjacent to one another.

Avoid sources of heat

Do not install the display in the vicinity of sources of heat, e.g. radiators, heating appliances or other devices which can generate or emit heat.

Do not subject display to excessive shocks

Take care when transporting! **Use the original packaging, and transport correctly oriented!** Be sure to protect the LCD module in particular from shocks.

Care of display / Cleaning agents

- The screen surface (front panel) is extremely sensitive to mechanical damage. Absolutely avoid scratches, shocks etc.
- Remove water drops immediately; extended contact with water discolors the surface.
- Clean the screen and the housing using only the cleaning agents referred to in the manual.

NOTICE

Touching the screen surface can result in brief disturbances to the image

Due to mechanical pressure or electrostatic discharging, touching the screen can result in brief disturbances to the image.

Only switch on cold displays following their adaptation to room temperature

If the display is brought into a room with a higher or rising temperature, condensation is formed inside and outside the unit. In such a case, do not switch on the display until the condensation has evaporated. The display will otherwise be damaged.

What to do if the display is faulty

If the following conditions exist, the display must be disconnected from the power supply and checked by qualified personnel:

- Damage to the plug or power cable.
- Following the entry of liquid into the unit.
- If the unit has been exposed to moisture.
- If the unit does not function or if you cannot eliminate a fault using the manual.
- If the unit has been dropped and/or the housing damaged.
- If the unit smells of burning or produces peculiar noises.

Note for installation in the USA and Canada

Molded power supply plugs must comply with the requirements for "hospital grade attachments" CSA Std. C22.2 No. 21 and UL 498.

Note for installation in China

Only use the the power cables approved for China. These power cables are identified by the labels "CCC" or "CQC".

See also

Installation site (Page 21)

General connection information (Page 25)

Connecting the signal cables (Page 28)

Connecting the line cord (Page 30)

Serial interface (Page 35)

Cleaning (Page 81)

Safety specifications (Page 90)

2.2 Product-specific safety notes

⚠ DANGER

If the SCD / SMD 19102 is mounted on a stand:

Adjust the display height carefully, otherwise danger of injury

When adjusting the height of the display, make sure that you do not trap your fingers or any other objects.

CAUTION

Notes on installation

The stability of the display must be ensured following mounting of the stand/holder. The insertion depth of the mounting screws into the display must be between 7 and 9 mm.

Subsequent mounting of a stand

The SCD / SMD 19102 C and SCD / SMD 19102 CP displays are delivered without a stand. To ensure that the complete system (display and stand) complies with the EN 60601 standard, a subsequently mounted stand must also comply with the EN 60601 standard.

See also

Mounting of unit (Page 23)

Installing/removing the display stand and cable for the SCD 19102 (Page 31)

Description

3

3.1 Scope of delivery

Note

It is recommendable to keep the packaging material for subsequent transport of the display.

All SCD / SMD 19102 displays are delivered with the following components:

- CD with user manual and SMfit® Total Care
- European power cord
- US power cord
- Chinese power cord
- DVI-D video cable

3.2 Applications

The high-end 19" (48 cm) color and gray scale flat panel displays:

SCD 19102 C	Landscape, ceiling suspension
SCD 19102 CP	Landscape, ceiling suspension, with protective front pane, IPx2 at front
SCD 19102 D	Landscape, desktop, with multifunctional stand
SMD 19102 C	Landscape, ceiling suspension
SMD 19102 CP	Landscape, ceiling suspension, with protective front pane, IPx2 at front
SMD 19102 D	Landscape, desktop, with multifunctional stand

have been specially designed for medical diagnostics according to the safety standard IEC 601. The displays comply with the safety standards UL 2601 and EN 60601-1.

3.3 Important features

The Flat Panel Display has the following features which permit a wide range of applications:

Compact design

Low weight and small dimensions with improved performance make the SCD / SMD 19102 high-end color flat panel displays preferable to conventional CRT monitors. Thanks to the equally narrow frame on each edge, the display fits into any environment, and is ideally suited to both desktop and ceiling suspension.

Perfect picture reproduction thanks to LCD technology

The use of LCD technology eliminates picture geometry distortions and color spots.

The high-end color and gray scale flat panel displays provide flicker-free pictures even at low refresh rates (60 Hz). The SCD / SMD 19102 high-end color and gray scale flat panel displays therefore meet even the highest ergonomic requirements.

Modification of gray scale setting

In medical applications (e.g. for X-rays, computer tomography and MRI scanners), where pictures are usually displayed in shades of gray, the gray values can be adapted to the user's eye: this display setting, which is referred to as calibration, is performed at the factory and is therefore available on shipment (factory calibrated display). In addition, five different settings (Look Up Table – LUT) are saved in the display. In order to switch to other LUTs, please contact the service personnel, who will perform the setting via the on-screen display (OSD – Service level 2) or the SMfit® Total Care (automatic calibration tool) software (also Service level 2).

Screen resolution

The SCD / SMD 19102 high-end color flat panel displays are equipped with an active 19" TFT display module which provides a very wide viewing angle. The display offers maximum gray scale contrast (display function) across a very wide viewing angle (in-plane switching (IPS) technology). The optimum picture resolution is 1280 x 1024 pixels. Video signals with other resolutions, as are common in medical technology, are enlarged or reduced to fit the screen size. Alternatively, they can be displayed in their original size (1:1).

RGB input (15-pin Sub-D/DVI/BNC)

SCD 19102

- The display is connected to the computer system using either the 15-pin Sub-D connector or the DVI-I input socket.

SMD 19102

- The display is connected to the computer system using either the 15-pin Sub-D input socket, the BNC sockets or the DVI input socket (digital only).

If necessary, the monitor display is adapted using an OSD menu.

Video inputs

The SCD / SMD 19102 displays feature two additional analog video inputs. The displays can therefore be operated with analog standard video signals (PAL/NTSC). The RGB and video inputs can be simultaneously connected to different signal sources.

Force Mode

The Force Mode function is used to adapt the SCD / SMD 19102 displays to special timing settings.

Protective glass

The SCD / SMD 19102 CP has anti-glare protective glass fitted over the top of the LCD panel to protect the surface of the panel against bumps and scratches. The display is protected at the front against moisture (IPx2 protection). The space between the protective pane and the panel is sealed to prevent dust from entering, thus helping ensure the internal surfaces remain clean.

Landscape and portrait modes

The display can be used in landscape and portrait modes. The image rotation for portrait mode is made on the graphics card.

In portrait mode, the keypad is positioned at the top right and the OSD is not rotated (i.e. the OSD inscription "Dynamic help for keypad function" is still positioned above the keys).

Application planning

4

4.1 Installation site

Provide adequate ventilation

Ventilation slots are located on the rear of the housing.

The distance at the rear must be at least 10 cm from a wall or 15 cm from other units.

Observe the permissible ambient temperature range

The unit must not be operated outside the permissible ambient temperature range.

Desktop installation

If the SCD / SMD 19102 is mounted on a stand, it must be positioned on a hard, horizontal surface.

Avoid reflections on the screen

The display has an anti-glare surface which is only effective with a clean, grease-free screen.

The SCD / SMD 19102 CP display includes an optically coated protective glass pane, which is well suited for use in a germ-free environment when cleaning agents are used.

If the screen surface is dirty, clean it using a suitable microfiber cloth.

Please note the additional cleaning instructions, see the section "Service and Maintenance" (Page 81).

The display should be positioned so that reflections of lights, windows, furniture with shiny surfaces or light-colored walls do not appear on the screen.

In order to reduce mirroring on the unit, only use non-dazzling reflector lights for the ceiling lighting.

Change of environment

If the unit is brought into a warm environment from a cold one, condensation may form in the unit. The unit should not be switched on until all the condensed water has evaporated, including that inside the unit. This may take several hours, depending on the conditions.

See also

Cleaning (Page 81)

Assembly

5

5.1 Mounting of unit

Ceiling suspension

The display can be mounted flush with horizontally and vertically adjacent displays.

The following must be observed when mounting (100 mm hole spacing according to VESA standard):

Information on the fastening screws	
Number	4
Thread	M4
Strength	8.8
Insertion depth	7 mm minimum / 9 mm maximum
Torque	Max. 3 Nm

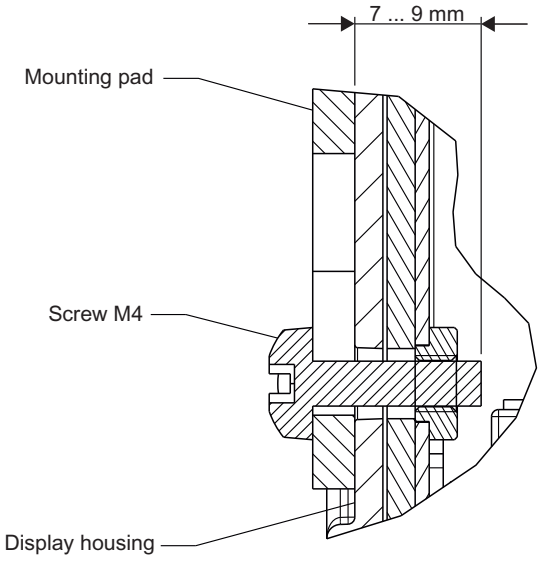


Figure 5-1 Insertion depth of mounting screws

See also

Installing/removing the display stand and cable for the SCD 19102 (Page 31)

Product-specific safety notes (Page 16)

Connecting

6

6.1 General connection information

⚠ CAUTION
All information and warnings related to this product must be observed to ensure danger-free operation.

CAUTION
Information for end customers All modifications to settings may only be carried out by trained servicing personnel, otherwise the guarantee is canceled.

The display is designed for individual connection to a graphics card with a power supply of 110 or 240 V (TN-S system with PE conductor).

CAUTION
Observe shielding measures Please observe all local EMC guidelines pertaining to shielding. Ignoring such requirements could allow signals to interfere with the proper operation of the display. **To guarantee perfect image reproduction, the following instructions should be observed:** • Only shielded cables are permitted for all signal connections. • Screw tight or lock all plug-in connections. • Signal and power cables must not be routed through the same duct. • The display must not share a power supply with motors or valves (interference peaks!).

See also

Electromagnetic compatibility (Page 90)

General safety notes (Page 11)

6.2 Connector location

The connectors are located within the connection compartment under the cover on the rear of the display. The power switch is not covered and is freely accessible.

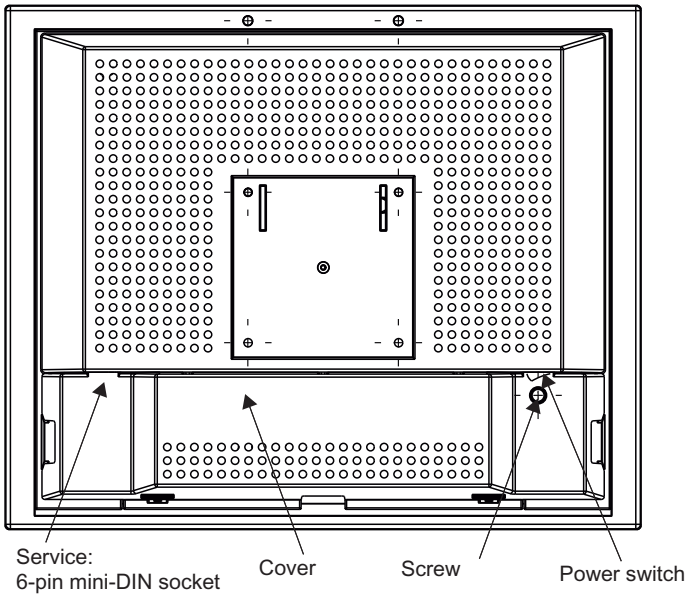
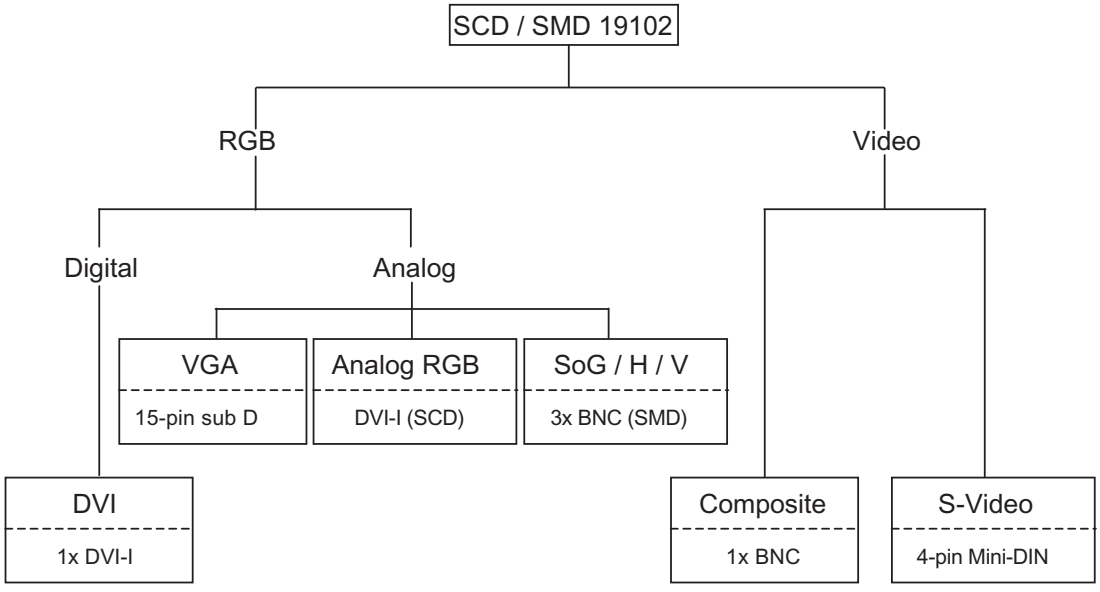


Figure 6-1 Rear view of SCD / SMD 19102

6.3 Summary of signals and connections



6.4 Connector panel

A connection panel for the signals and power supply is located at the rear of the flat panel display.

SCD 19102

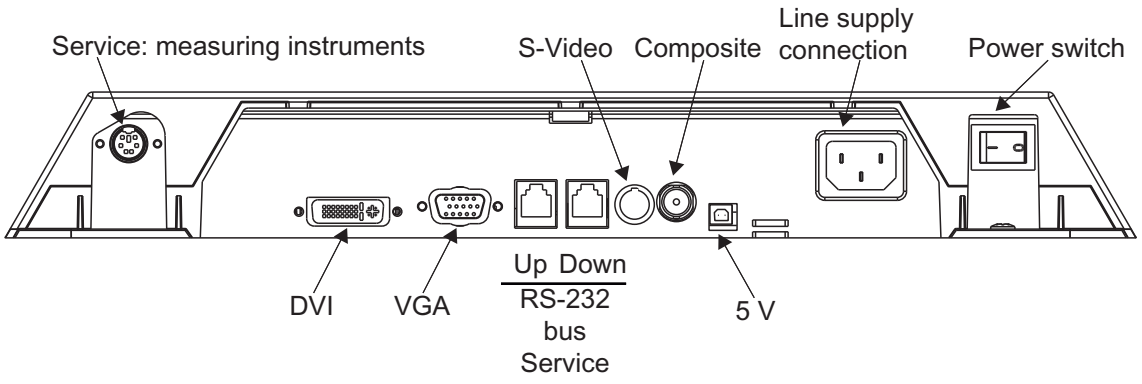


Figure 6-2 Connection panel of the SCD 19102 high-end color flat panel display.

SMD 19102

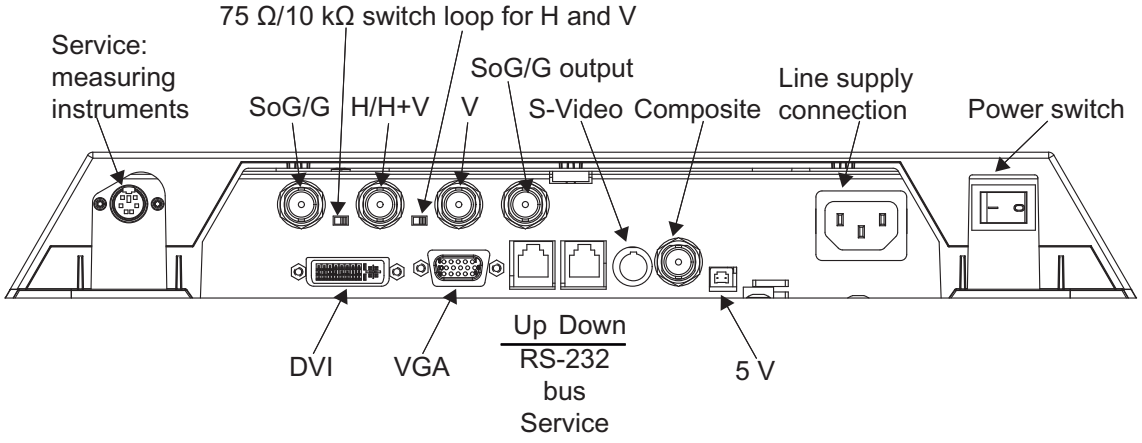


Figure 6-3 Connection panel of the SMD 19102 high-end gray scale flat panel display

See also

Connecting the signal cables (Page 28)

Connecting the line cord (Page 30)

Serial interface (Page 35)

6.5 Connecting the signal cables

Note

- The video signals coming from a graphics card are referred to below as RGB signals, and those coming from a camera, DVD player, video recorder etc. as video signals.
  In the OSD menu, some of the menu displays are also appropriately identified by RGB or video in the header.
- At least one signal source must be connected in order to activate the OSD.
- All signal inputs may be connected simultaneously.
- The Up and Down keys can be used to select which RGB or video source is to be displayed when the OSD is not active. Selection is also possible in the OSD.

CAUTION

- When connecting to the BNC sockets, the three cables for the R, G and B signals must be of equal length. Otherwise, color fringing, which appears similar to convergence faults, will occur due to unequal propagation times.
- The levels of the incoming analog RGB signals must be equal.
- If the same RGB signal is connected to several displays via the BNC sockets using T-connectors, the R, G, B and H DIP switches on the displays must be set to 10 kΩ. These DIP switches must be set to 75 Ω on the last display in the sequence.

The signal connections are located at the rear of the flat panel display.

15-pin Sub-D socket

- Connect VGA cable with 15-contact Sub-D connector (male) for the analog input to the 15-contact Sub-D connector (female).

DVI socket

The DVI cable can be connected in two manners:

- With DVI digital signal or
- With DVI analog signal (SCD 19102 only)

BNC sockets (SoG / H / V)

- With a wire (R or **G** or B, with composite synchronization):
  - Connecting wire for BNC connection "G".
- With three wires (R or **G** or B, with separate synchronization):
  - Connecting wire for BNC connections "G", "H/H+V" and "V".

4-pin mini-DIN socket (video input)

- Connect video cable for the sync video input (Y/C signal) to the 4-pole mini-DIN socket.

BNC socket (video input)

- Connect video cable for the composite input to the BNC socket.

See also

Connector panel (Page 27)

General safety notes (Page 11)

6.6 DIP switches (for SMD 19102 only)

The SMD 19102 has two DIP switches between the three BNC sockets.

These switches are used for changeover between high impedance (10 kΩ) and low impedance (75 Ω) for the H and V synchronization inputs.

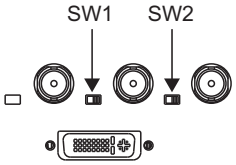


Figure 6-4 Position of the DIP switches

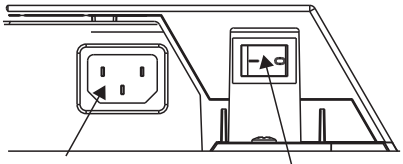
Delivery state

Switch	Function	Delivery state
SW1	Input resistance for H/H+V signal	75 Ω
SW2	Input resistance for V signal	75 Ω

6.7 Connecting the line cord

The power supply socket is on the rear of the flat panel display (only open using appropriate tool!). The display power supply is connected using an appliance plug.

- Insert the appliance plug of the supplied power cord into the mains socket.
- The power cord can be secured using a cable grip.



⚠ WARNING

- Only use the supplied power cord, or a cable with PE conductor and appliance plug to DIN 49 547, IEC 320 (max. length 3 m). Furthermore, the cable must adhere to all local safety regulations applicable to the specific country in which the display is used.
- Device fuses must only be replaced by the repair centers or servicing department.
- **Note for North America:** Molded power supply plugs must comply with the requirements for hospitals with respect to CSA Std. C22.2 No. 21 and UL 498.

See also

Connector panel (Page 27)

General safety notes (Page 11)

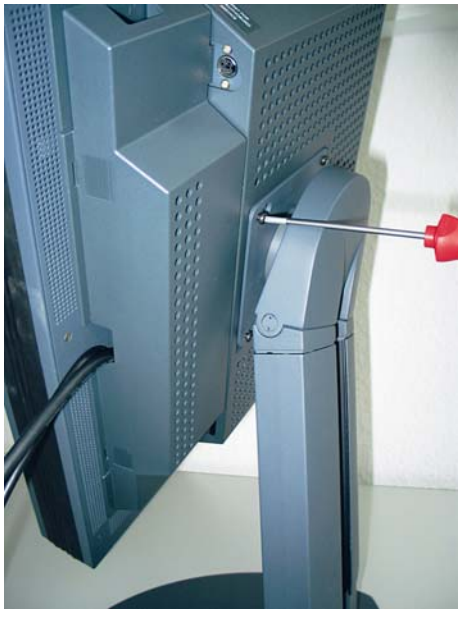
6.8 Installing/removing the display stand and cable for the SCD 19102

CAUTION
Do not use screws of excessive length (Page 23) Screws which are too long can damage mechanical and electronic components of the unit.

1. Attach the connecting cable before mounting the foot on the display.
2. Fit the screws on the mounting plate loosely.

3. First insert two screws into the bottom two drilled holes of the display stand.
4. Then insert the remaining screws into the top two drilled holes.
5. Slowly lower the display.

6. First tighten the top two screws.



7. Then rotate the display slightly, and tighten the bottom screws.

8. Lay the connecting cable in the cable duct.

9. Then fit the cable duct cover or press it down.

CAUTION
Do not route the cable too tightly in the cable duct When the display is rotated about its axis, the connecting cable could be broken or trapped. For this reason, the connecting cable must not be routed too tightly in the cable duct.

Completely assembled display stand

See also

Product-specific safety notes (Page 16)

6.9 Serial interface

⚠ WARNING

- Apart from the serial spot meter and the universal serial luminance meter, no other devices are permitted to be connected to the service socket.
- Connection and removal of a unit may only be carried out by servicing personnel or those trained by them.
- Serial Spot Meters or Serial Luminance Meters must not be connected in the presence of patients.

The display has three serial RS 232 interfaces:

- **Downstream RJ11 socket**:

  identified in the Fig. "Possible configuration – serial bus mode" by "**2**". The socket is located **on the right** (landscape version) **or at the bottom** (portrait version) on the rear of the display.

- **Upstream RJ11 socket**:

  identified in the Fig. "Possible configuration – serial bus mode" by "**1**". The socket is located **on the left** (landscape version) **or at the top** (portrait version) on the rear of the display, right next to the VGA plug.

- **6-pin mini-DIN socket (downstream):**

  identified in the drawing below as “**3**”.

  This serial interface (also called the "service socket") is easily accessible at the rear of the display. The 6-pin mini-DIN socket is available for the connection of a Universal Serial Luminance Meter or a Serial Spot Meter.

Please note the diagram for the "6-pin mini-DIN socket": It shows the lower left corner of the underside of the display (viewed from rear).

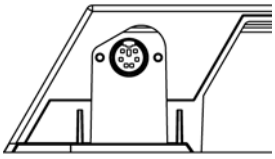


Figure 6-5 Service socket for measuring instruments

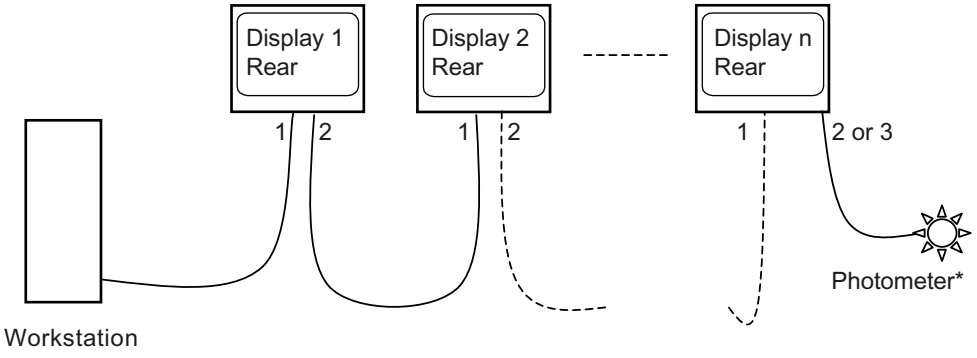


Figure 6-6 Possible configuration – serial bus mode

* Photometer is a generic term for the measuring instruments suggested by EIZO GmbH Display Technologies:

- Universal Serial Luminance Meter with adapter from 9-contact Sub-D to 6-contact mini-DIN socket **)
- Serial Spot Meter with adapter from 9-contact Sub-D to 6-contact mini-DIN socket **)

** Service mode! Not permitted in vicinity of patients.

If the display connection is made via the serial bus (see Fig. "Possible configuration – serial bus mode"), the setting "Serial bus" must first have been activated using "On Screen Display → Service level 2 → Others". To this end, the bus address (1, 2, 3... - assignment of different numbers to the displays connected via the same bus) must be assigned to each device (also using "On Screen Display → Service level 2 → Others").

Settings, measurements, calibration, automatic quality testing etc. can be performed automatically using the SMfit® Total Care calibration program.

See also

Connector panel (Page 27)

Menu functions (Page 40)

General safety notes (Page 11)

Commissioning

7

7.1 Switching on the display

- Switch on the device using the power switch.

The green operation LED must now light up permanently.

See also

Troubleshooting (Page 83)

7.2 Operator controls

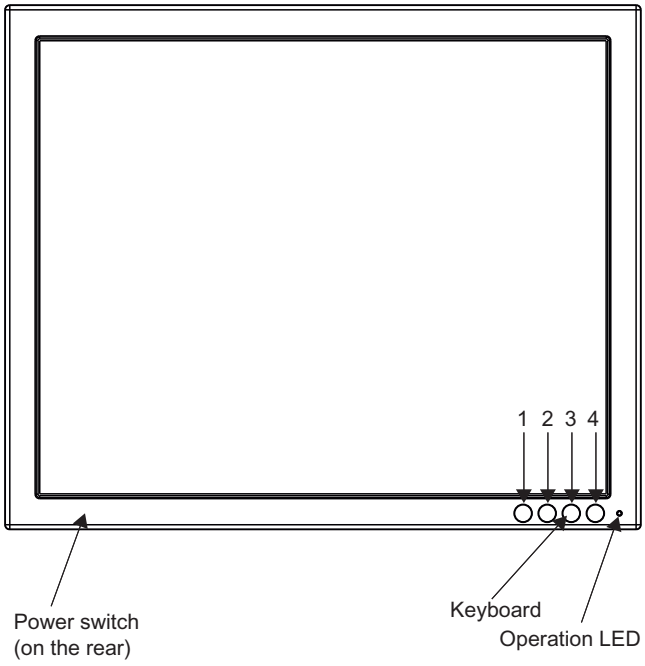


Figure 7-1 Front view: Keypad and status LED

The four buttons and the status LED are located on the front in the bottom right-hand corner of the display .

The status LED is lit when power is supplied to the device and the power switch is set to On.

Key functions

In the OSD menu, the keys have the following functions:

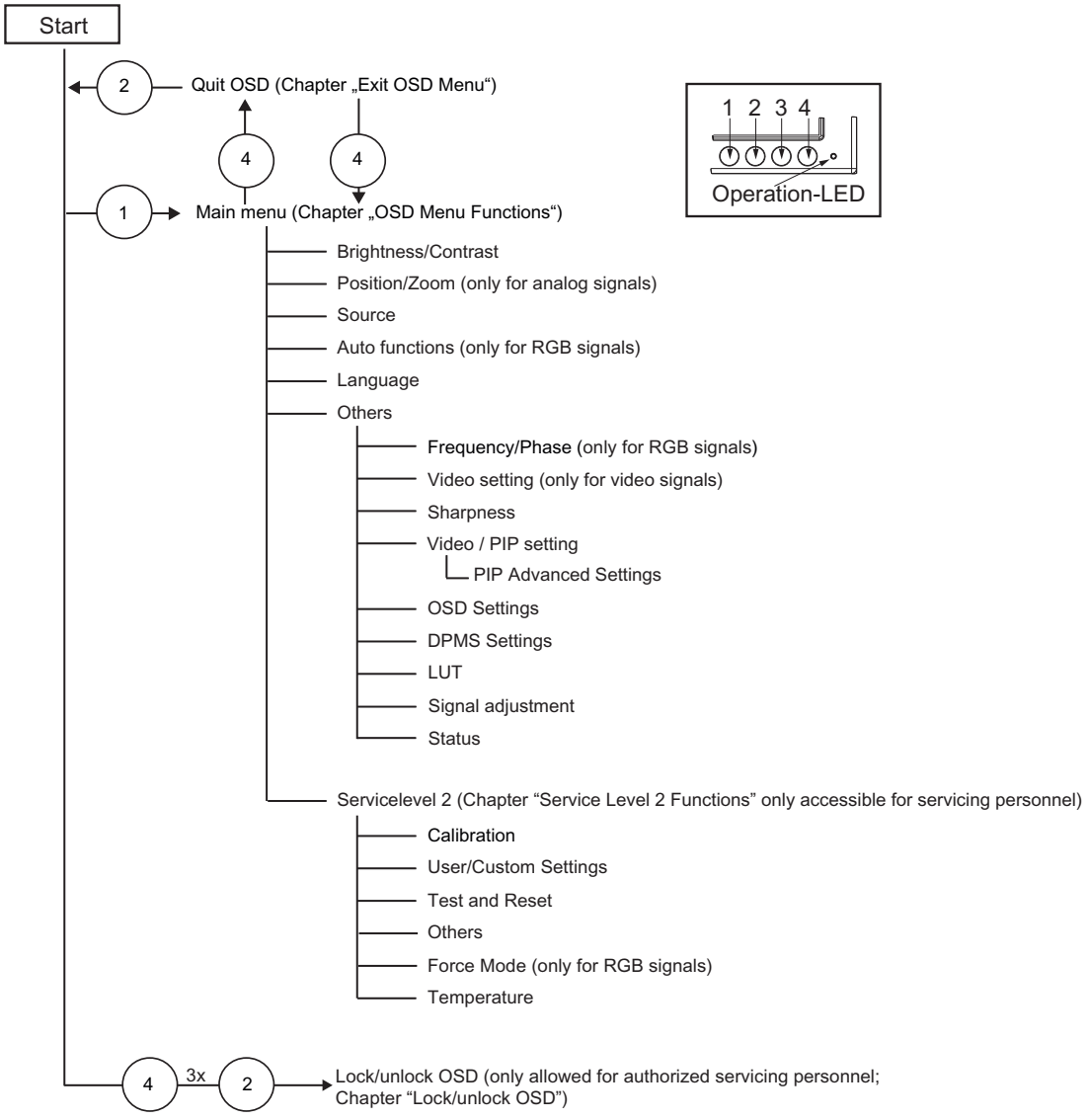
Key	Situation	Action
1	Always	Scrolling
2	Submenu is selected	Select submenu
	Function is selected	Increase/change value
3	Function is selected	Decrease/change value
4	Apart from in the "Exit OSD" menu	Return to previous menu level (settings are retained)
	In the "Exit OSD" menu	Return to main menu (settings are retained)

7.3 Description of OSD menu

7.3.1 OSD overview

The OSD menu is used to make settings for operation of the flat panel display with a source.

The OSD can also be operated without an input signal to a limited extent.



See also

Exit OSD (Page 52)

Menu functions (Page 40)

Service level 2 functions (Page 53)

Lock/unlock OSD menu (Page 60)

7.3.2 Menu functions

Program levels

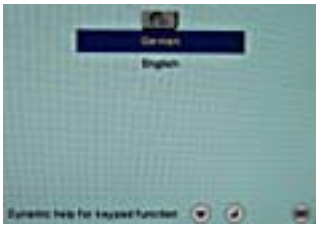
Printed/identified in bold type Menu title (main menu or first submenu)

Main menu

Main menu	Function	Adjustment/range	Description
Brightness/Contrast	**Brightness**	0 … 100 %	**Set brightness** Adapting the representation of darker picture areas. *Note*: The brightness settings are already optimized for digital DVI signals. Manual changes to these values are not recommended, as this can result in an impairment of picture quality (loss of gray scales).
	Contrast	0 … 100 %	**Set contrast** Adapting the representation of brighter picture areas. *Note:* The contrast settings are already optimized for digital DVI signals. Manual changes to these values are not recommended, as this can result in an impairment of picture quality (loss of gray scales).

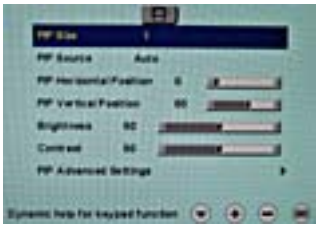
Main menu	Function	Adjustment/range	Description
	Backlighting	0 … 100 % Recommended setting: Max. 80 %	**Adjust brightness of display backlighting** Adjustment of overall brightness to ambient lighting. *Note:* If the function "Backlight Command" is activated in the "Others → LUT" menu, the backlight setting cannot be changed.
	Color (SCD 19102 only)	1, 2, 3, User 1: 9300°K 2: 7300°K 3: 6500°K (native) User factory setting: "6500 °K (native)". This color can be set by the user) *Default: 1 (6500°K)*	**Set the desired color temperature or hue** Three fixed color temperatures and one adjustable color temperature can be selected. Color locations 1 and 3 cannot be saved. They only remain active while the timing is applied. *Note:* The user color setting can be changed when "User" is selected.
	User color (SCD 19102 only)	**Define user color temperature** The color setting defined here can be subsequently selected using the color function (selection "User"). *Note* If the color location setting is corrected with "User color", some color levels may be lost. To prevent this from happening, the colors can be corrected via "LUT" with SMfit® Total Care.	
	→Red color temp.	-32 ... +32	Select red component of display
	→Green color temp.	-32 ... +32	Select green component of display
	→ Blue color temp.	-32 ... +32	Select blue component of display
Position / zoom (not for analog picture signal)	**H position**	0 … 100 %	**Shift picture in horizontal direction** With identical display and graphics card settings, the complete picture to be displayed fills the display area of the monitor with the exact number of pixels.

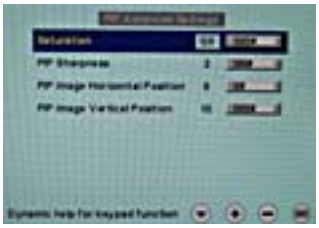
Main menu	Function	Adjustment/range	Description
	V position	0 … 100 %	**Shift picture in vertical direction** With identical display and graphics card settings, the complete picture to be displayed fills the display area of the monitor with the exact number of pixels.
	Zoom	1 to 1 Fill all Fill ratio Square *Default: Fill all*	**Selection between different picture size settings:** • *1 to 1*: The picture is displayed on screen with its original resolution. • *Fill all*: The picture is displayed to fill the complete screen (1280 x 1024 pixels). • *Fill ratio*: The picture is zoomed to the maximum screen area with retention of the aspect ratio. • *Square*: The picture is zoomed to square format.
Source 	**Select source for main display** Selection of source for full format image. If you call this OSD menu, the current source is displayed.		
		SCD 19102: VGA DVI Digital Composite S-Video DVI Analog *SMD 19102:* VGA DVI Digital Composite S-Video SoG / H / V	After switching the display off and on again, the sources are queried in sequence. *Note* Alternatively, the source can be selected through a hot key function (see the OSD menu → Others → OSD setting).

Main menu	Function	Adjustment/range	Description
Auto functions (only for analog signal) 	**The auto functions support automatic adjustment of the parameters.** **The quality of the settings depends on the picture contents and the type of synchronization.** All settings can of course also be optimized manually using the corresponding items in the OSD menu. *Note:* We recommend that an SMPTE test picture is displayed		
	Auto brightness/contrast	On / Off *Default: On*	**This parameter can be selected for the auto function** With "On", the brightness and contrast are adjusted when the "Auto functions" are executed. With "Off", the brightness and contrast are not adjusted when the "Auto functions" are executed. *Note* This function is not available for "Sync on green signals".
	Auto position/phase/frequency	On / Off *Default: On*	**This parameter can be selected for the auto function** With "On", the position, phase and frequency are adjusted when the "Auto functions" are executed. With "Off", the position, phase and frequency are not adjusted when the "Auto functions" are executed.
	Execute selected auto functions	Execute	**The selected auto functions are executed** This sets brightness, contrast, position, frequency and phase to their optimum values. The quality of the function depends on the applied image contents.
Language 		German, English *Default: English:*	**Use the "Language" menu to select the language of the OSD menu** German or English can be selected. English is the delivery default setting.

Main menu	Function	Adjustment/range	Description
Others 			
	Frequency / phase(only for analog signal)		
	Frequency(only for RGB signals)	1638 … 1738	**Setting the frequency and phase of the input signal** If the vertical lines are still slightly fuzzy, adjust the "Frequency/Phase" setting. *Note* We recommend that a vertical line from the "Pixel On/Off" test pattern is displayed.
	Phase(only for RGB signals)	0 … 255	
	Video setting (only for video signals)		
	Saturation (only SCD 19102 for video signals)	1 … 255 *Default: 128*	**Adjusting the saturation for video signals**

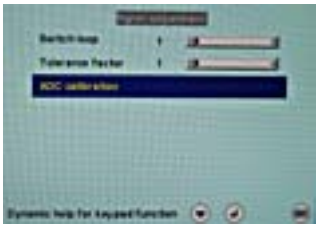
Main menu	Function	Adjustment/range	Description
	Sharpness		
	Interpolation filters	1 ... 5	**One of 5 filters can be selected for setting the sharpness, in order to reduce scaling artefacts.** You must visually determine which sharpness setting is best. Common filters are available for the RGB sources (VGA, DVI). The interpolation filters depend on the input resolution. A filter is not normally used with 1280 x 1024 since each physical pixel can be controlled individually by its own pulse. At lower resolutions, the filter calculates the value for the non-controlled pixels. The larger the filter number (No. 1, 2, …5), the finer/deeper the calculation, i.e. the picture appears smoother and more details are lost. Users should individually set the filter depending on the application: Filter No. 1 produces the "sharpest" picture, as it does the least filtering. Filter No. 5 filters the most; the greatest danger exists with this filter that details can no longer be recognized.

Main menu	Function	Adjustment/range	Description
	**Video/PIP setting**		
	PIP size	Off 1 2 3 *Default: Off*	**Activating and deactivating the PIP window and setting the PIP window size**
	PIP source	Auto VGA DVI Digital Composite S-Video DVI Analog (for SCD19102) SoG / H / V (for SMD19102) *Default: Auto*	**The source is selected that is to be shown in the PIP window.** "VGA" and "DVI" or "SoG / H / V" (SMD 19102) cannot be displayed simultaneously. *Note* When an RGB signal is displayed in the PIP window, resolutions of up to 1280 x 1024 can be displayed in PIP size 3 and 800 x 600 in PIP size 2. The PIP window remains black if the signal cannot be displayed. To display the signal: • Reduce the resolution of the signal or • Change the window size under "PIP size"
	PIP horizontal position	Slider	**Shift the PIP window in the horizontal direction**
	PIP vertical position	Slider	**Shift the PIP window in the vertical direction**
	Brightness	0 … 100 %	**Adjust the brightness of the PIP window** Adapting the representation of darker picture areas. *Note:* The brightness settings are already optimized for digital DVI signals. Manual changes to these values are not recommended, as this can result in an impairment of picture quality (loss of gray scales).

Main menu	Function	Adjustment/range	Description
	Contrast	0 … 100 %	**Adjust the contrast of the PIP window** Adapting the representation of brighter picture areas. *Note*: The contrast settings are already optimized for digital DVI signals. Manual changes to these values are not recommended, as this can result in an impairment of picture quality (loss of gray scales).
	**PIP advanced settings**		
	Saturation (only SCD 19102 for video signals)	1 … 255 *Default: 128*	**Adjusting the saturation for video signals displayed in PIP**
	PIP sharpness (only for analog signal)	1 ... 5	**One of 5 filters can be selected for setting the sharpness of the PIP image in order to reduce scaling artefacts.** You must visually determine which sharpness setting is best. See "Sharpness" in the "Others" menu: Description of details via the filters.
	PIP image horizontal position (only for analog signal)	Slider	**Shift the image in the horizontal direction in the PIP window**
	PIP image vertical position (only for analog signal)	Slider	**Shift the image in the vertical direction in the PIP window**
	OSD settings		
	Horizontal position	Slider *Default: Right*	Setting of horizontal position of OSD menu
	Vertical position	Slider *Default: Down*	Setting of vertical position of OSD menu
	Background	Opaque Transparent *Default: Opaque*	Selection of OSD background (Opaque or Transparent).
	LED	Dimmed Lit *Default: Dimmed*	Adjust the brightness of the status LED.

Main menu	Function	Adjustment/range	Description
	OSD lock/hotkey	Hotkey brightness / contrast Hotkey backlight Hotkey select source *Default: OSD available*	**Selection of different OSD lock/hotkey settings:** • *Hotkey brightness / contrast:* The OSD menu is locked and can only be unlocked using a specific key combination. Only the brightness and contrast can be changed by any user with the OSD keys without the need for a key combination. • Hotkey backlight: The OSD menu is locked and can only be unlocked using a specific key combination. Only the backlight can be changed by any user with the OSD keys without the need for a key combination. • *Hotkey select source:* The OSD menu is locked and can only be unlocked using a specific key combination. Only the source can be changed by any user with the OSD keys without the need for a key combination. *Note:* See "Lock OSD menu" (Page 60)
	Hotkey for PIP activation	Active Inactive *Default: Inactive*	**Activating and deactivating the PIP window with button 4 on the front** If "Active" is selected, the PIP window can be opened or closed with the saved settings using button 4 on the front without opening the OSD menu.

Main menu	Function	Adjustment/range	Description
	DPMS setting		
	DPMS	On Off *Default: On*	**The DPMS (Display Power Management System) can be switched on/off** When the DPMS is activated and there is no input signal, the backlight is switched off or darkened (depending on the parameter for the "DPMS Off mode": see below). This saves power, and increases the service life of the backlight.
	DPMS Off mode (backlight)	Dimmed Off *Default: Dimmed*	"DPMS Off mode" can be set to "Dimmed" or "Off". The backlight is then either dimmed or switched off when the DPMS mode is active.
	LUT choice		
	LUT backlight command	On / Off *Default: On*	**Permits access to the backlight** • When "On" is selected, the backlight cannot be changed in the "Brightness/contrast" menu. • When "Off" is selected, the backlight can be changed in the "Brightness/contrast" menu.
	Select display function	1 ... 5 *Default:* *SCD 19102: LUT 1*	**Selection of display function: information on the selected curve** For further details on LUT settings, see "Display adjustment – LUT" (Page 63). The LUTs that can be selected are displayed in the table in the OSD menu.

Main menu	Function	Adjustment/range	Description
	**Signal adjustment**		
	Switch loop	1 … 20 *Default: 1*	The following four parameters are of relevance for this tool: • H-frequency • V-frequency • V-total • Interlaced/non Interlaced If one of these parameters changes, the display treats it as a timing change and initiates resynchronization via an "Auto in progress". To prevent this from happening as a result of each and every minor signal disturbance, the value representing the permissible number of faulty or changed frames must be increased in the case of unstable signal sources. *Disadvantage:* The higher the tab setting, the longer it will take for a desired timing change to occur (delayed by a number of milliseconds).
	Tolerance factor	1 … 20 *Default: 1*	**This tool only considers the H and V frequencies.** An increase in the tab value results in a larger tolerance band being defined. Minor frequency fluctuations within this range will not result in resynchronization ("Auto in progress").
	Signal (only for analog signal)	RGB Monochrome *Default:* • *RGB* (for SCD19102) • *Monochrome* (for SMD19102*)*	**Switch over signal between b/w and color operation** • If a monochrome signal arrives, it is green on the color display. • To obtain correct b/w images, set the "Signal" parameter to monochrome.

Main menu	Function	Adjustment/range	Description
	ADC calibration	Execute	**Automatically calibrate A/D converter for the applied video level** The video level range of the system is checked, and the display set accordingly. This results in optimum adjustment of the individual RGB A/D converters to the video source. The calibration results in a larger and more flexible video level range (e.g., the full brightness is also achieved at 700 mV if the video level is limited at this value). *Note* A specific test pattern and timing are prerequisites! The A/D converters have already been factory-set and need not be readjusted.
	DVI enhancer		**Enhances the DVI-D signal quality over long distances, even when standard cable is used**

Main menu	Function	Adjustment/range	Description
	Status	Information	**Current display settings in the respective picture mode can be called here.** • Operating hours of the display • Temperature in the housing (actual and maximum temperature over the complete service life of the display) • Firmware type and version • OSD version • Configuration version • Current timing • Current source • Screen resolution • Frequency of the input signal (line frequency and refresh rate)
Service level 2	Settings in this menu must only be carried out by servicing personnel! For further information, see "Service level 2 functions" (Page 53).		

See also

Exit OSD (Page 52)

7.3.3 Exit OSD

Exit OSD menu	Accept changes Reject changes	**You exit the OSD and can save or reject any changes.** Press button 2 if you unintentionally entered this menu and want to return to the main menu. *Note:* If the OSD menu is exited by changing the timing or switching off the monitor, the changes made are saved.

See also

Service level 2 functions (Page 53)

7.3.4 Service level 2 functions

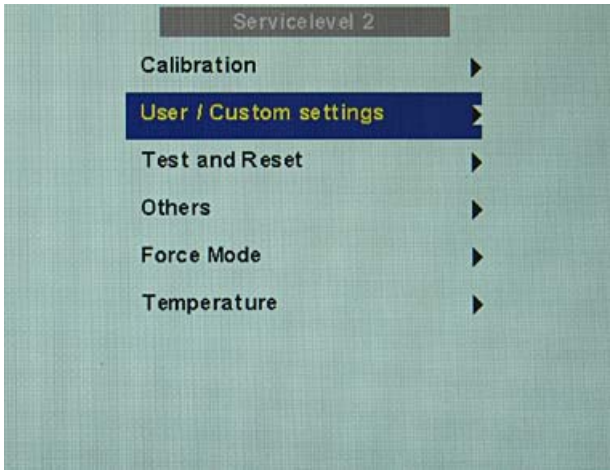
CAUTION
Only servicing personnel trained by EIZO GmbH Display Technologies have access to "Service level 2.

The "Service level 2" menu can be accessed from the OSD main menu.

Key combination for opening "Service level 2"

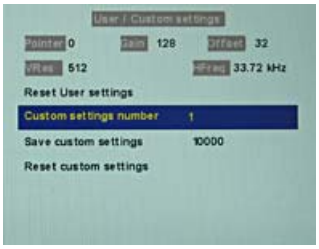
- Briefly press the Up key and immediately keep the Down key pressed.

Menu structure

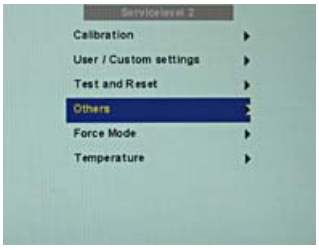


Service level 2	Function	Adjustment/range	Description
Calibration 	**Temperature**	Information	**Specified as info in °C**
	Backlight command	Information	**Facility for reading out the current tab value of the backlight**
	Backlight sensor info	Information	• Backlight sensor regulation • Minimum and maximum regulation
	When backlight regulation is set to "On": **Backlight (regulated)**	0 … 100 %	**Adjustment of brightness of display backlight** Adjustment of overall brightness to ambient lighting.
	When backlight regulation is set to "Off": **Backlight (controlled)**	0 … 3360	**Backlight inverter value**

Service level 2	Function	Adjustment/range	Description
	Backlight regulation	On Off *Default: On*	**The backlight regulation (backlight sensor) is switched on or off**
	ADC calibration	Execute	**Automatically calibrate A/D converter for the applied video level** The video level range of the system is checked, and the display set accordingly. This results in optimum adjustment of the individual RGB A/D converters to the video source. The calibration results in a larger and more flexible video level range (e.g., the full brightness is also achieved at 700 mV if the video level is limited at this value). *Note* A specific test pattern and timing are prerequisites! The A/D converters have already been factory-set and need not be readjusted.
	Backlight margin	Information	**Remaining margin of backlight that can be used for regulation** *Note* The data is only displayed when the panel has warmed up (after approx. 20 min). The display value only serves for information purposes.

Service level 2	Function	Adjustment/range	Description
User / Custom settings 	**Reset User settings**	Execute	**All automatically stored timing data are deleted**
	Custom settings number	1 ... 5	**Custom settings can be saved here** A total of 5 custom settings can be generated. The digit is the code number for the memory location.
	Save custom settings		**Press the "Up" key to save the current picture settings and timing data to the memory addresses specified via the "Custom settings number".** The 5-digit combination indicates which individual memory addresses have been allocated. *Example:* 10010 ⇒ Addresses 1 and 4 have been allocated.
	Reset custom settings	Execute	**Clears the content of the five memory locations**

Service level 2	Function	Adjustment/range	Description
Test and Reset 	**Test pattern**	Off Color bars Gray bars Calibration picture *Default: Off*	**Fixed test patterns are available** The test patterns are generated directly in the display's processor. The test patterns can be used to analyze whether a fault is present in the control electronics or has to be searched for in the plugs/cables or video source. 1. If the test pattern is displayed without faults, one should first check the connections and video sources. 2. If the video source and the connections are OK, and if the test pattern is displayed perfectly, the fault must be searched for in the video input range of the monitor. The test patterns can also be used to check the panel quality: • Proof of the contrast with gray scales and color channels (independent of picture, picture program, graphics card and connectors). • All the pixels on the display area are activated (exception: The first column on the left of the panel remains black). Test of columns or line driver

Service level 2	Function	Adjustment/range	Description
	Reset to factory defaults	Execute	**All parameters are reset** The following are deleted: • User settings • Custom settings The following are reset: • Backlight • Sharpness • User color location • Signal settings • Black level settings • RGB relation • DPMS settings • Language • OSD setting • Gamma curve • Standard group • Info window settings • Serial interface settings • H-Scaler clip
	Restart	Execute	**The processor is reset** The power supply unit is not switched off. The monitor restarts.
Others 	**Info**	On Off *Default: Off*	**To display an info window** The info window is displayed on the bottom right of the screen if the source changes. It provides more detailed information about the set timing.
	Serial interface	On Off *Default: On*	**The serial interface can be activated or deactivated.** If the serial interface is deactivated ("Off"), it is possible to suppress e.g. the downloading of firmware.
	Serial bus	Enable Disabled *Default: Disabled*	**To configure a network of several displays** This function is used to interconnect several displays so that they can all be calibrated using a single computer (connected to the first display). *Note:* See the section "Serial interface" (Page 35)

Service level 2	Function	Adjustment/range	Description
	Bus address	Slider from 0 ... 10 *Default: 1*	**Definition of bus address for display.**
	H-Scaler clip	Slider from 0 ... 100	**Supports adjustment to the aspect ratio** The picture can be expanded or compressed in the horizontal direction.
	Motion image improvement	Active Inactive *Default:* *Interlaced signals: Active* *Progressive signals: Inactive*	**Activation of motion image improvement** • Undesirable comb effects can be reduced in the case of interlaced signals with PAL and NTSC resolutions connected to the "VGA" and "DVI Analog" signal inputs. • Undesirable staircase signals can be reduced in the case of non-interlaced signals (progressive) of up to 60 Hz connected to the "VGA" and "DVI Analog" signal inputs. *Note:* See Chapter "Motion image improvement" (Page 77)

Service level 2	Function	Adjustment/range	Description
Force Mode	**Blind mode**	Execute	**Force Mode is a tool for setting unknown timings that are not displayed via exact modes that have already been stored.** Suitable for the direct input of previously determined Force Mode data. *Note:* See the section "Display adjustment - Force Mode" (Page 64)
	Live mode	Execute	**Force Mode is a tool for setting unknown timings that are not displayed via Exact Modes that have already been stored.** Suitable for step-by-step setting of an unknown timing or for fine adjustment of a timing whose data have been entered using "Blind mode". *Note:* See the section "Display adjustment - Force Mode" (Page 64)
	Help	Execute	Brief description of the Force Mode functions
Temperature	**Temperature limit**	25 °C ... 90 °C *Default: 60 °C*	**The temperature can be selected here above which the display is dimmed**
	Shutdown temperature	25 °C ... 90 °C *Default: 70 °C*	**The temperature can be selected here above which the display is switched off**
	For SCD 19102: **Operation time above 160 cd** For SMD 19102: **Operation time above 400 cd**	Information	**Display operating hours counter over 160 Cd/m² for SCD 19102 and 400 Cd/m² for SMD19102**
	For SCD 19102: **Operation time below 160 cd** For SMD 19102: **Operation time below 400 cd**	Information	**Display operating hours counter below 160 Cd/m² for SCD 19102 and 400 Cd/m² for SMD19102**

7.3.5 Lock/unlock OSD menu

CAUTION
Locking/unlocking of the OSD is only permissible for authorized servicing personnel. The OSD must be locked if a faulty operation on the part of the user could have a detrimental effect on the approved application of the display.

Lock

You can lock the call from the OSD if the OSD is not active.

To lock, enter the following key combination without interruption:

- Press button "4" and then button "2" three times.

  The OSD menu is locked.

Cancel locking

- Press button "4" once and then button "2" three times (if the OSD is not active).

  Locking of the OSD menu has been canceled.

Delivery state

The OSD is unlocked.

See also

Menu functions (Page 40)

7.4 Make settings

Optimum picture quality

NOTICE
To achieve optimum picture quality, the display must be operated with a graphics resolution of 1280 x 1024 pixels. The corresponding setting for the graphics card must be made in the operating system.

7.4.1 Screen saver

Image sticking

Image sticking is an effect in which a faint image of the previous screen contents can be seen after the display contents have changed. By using a screen saver with permanently changing screen contents, unnecessary effects of the same image are avoided.

- A screen saver function should be used in order to reduce "image sticking" that may occur with LCD displays.

Image sticking occurs despite use of a screen saver function

If image sticking occurs despite use of a screen saver function, this can be rectified or reduced by leaving the display switched on for a longer period with a black image.

7.4.2 Adjusting the image geometry

The display automatically recognizes the applied standard, and set-up values for each standard are preprogrammed. However, depending on the graphics card used, it may still be necessary to align and size the picture for the selected standard.

7.4.3 Adjusting the brightness and contrast

The brightness and contrast must be adjusted for the respective graphics card (different output levels) in the system on site.

CAUTION
Brightness and contrast can only be set accurately using a photometer (Serial Spot Meter, Serial Luminance Meter, Universal Serial Luminance Meter, Advanced Serial Luminance Meter).

CAUTION
Fine adjustment of analog inputs: only via 15-pin Sub-D and DVI-I sockets **Fine adjustment of digital input: not necessary** • Fine adjustment of the Flat Panel Display should only be carried out via the two analog ports (15-pin Sub-D and DVI-I). • The digital input (DVI-D) does not require a fine adjustment since the signal display is always optimum. With a fine adjustment, it is possible that gray scales are not displayed.

Note on adjustment

- Use the SMPTE test pattern.
- Adjust the brightness so that image sections with 5 % and 0 % gray value still visibly contrast.
- Adjust the contrast so that image sections with 95 % and 100 % gray value still visibly contrast. To adapt the luminosity to the ambient lighting, adjust the backlight brightness (caution: factory-set brightness is no longer observed).

See also

Menu functions (Page 40)

7.4.4 Adaptation of display – video source / graphics card

As with all monitors, the Flat Panel Display also has certain limits, e.g. maximum resolution and refresh rate.

- The graphics card must be set when using the display such that the limits are observed.

NOTICE
Fine adjustment of the Flat Panel Display can only be carried out via the two analog ports (15-pin Sub-D and DVI-I). The digital input (DVI-D) does not require a fine adjustment since the signal display is always optimum.

RGB sources (via 15-pin Sub-D or DVI-I connector) supply analog signals which are basically intended for conventional CRT monitors and which are processed directly by them.

In contrast, the analog signals must be converted for the Flat Panel Display into digital signals by a video digitizer. Depending on the source, cable length and video mode (e.g. VGA, SVGA, XGA), this conversion may cause certain deviations which cannot be corrected fully automatically by the Flat Panel Display.

A manual fine adjustment is therefore necessary during which the Flat Panel Display (or, more precisely, the video digitizer) is matched to the respective video source.

The fine adjustment includes, for example, setting the horizontal/vertical picture position and the picture sharpness. This can be done via the OSD menu.

In order to optimize the display settings for the installed graphics card and guarantee that all grayscales can be distinguished, we recommend that brightness and contrast are adjusted only for the analog inputs.

Please note that the calibration (in the look up table) is not affected by these settings (EIZO GmbH Display Technologies displays are factory-calibrated and retain these settings):

- Use a picture with 0% gray value (black) and a suitable measuring instrument (a spot meter is recommended) in order to reduce the brightness with the aid of the OSD control elements until the measuring instrument displays constant values (i.e. the measured value no longer changes). Then increase the brightness slightly until the display is just above the lowest black level (one step is generally sufficient).
- The white value can be set in the same way. Again, use a test pattern with 100% gray value (white) and the measuring instrument. Only the contrast should be adjusted, to ensure that the black value remains unchanged.
- Increase the contrast until the measuring instrument no longer registers an increase in light density. Then reduce the contrast to slightly below the maximum value (one or two steps are usually sufficient).
- Make sure once again that the black value has not changed. If it should have changed, repeat the two steps described above until the value no longer changes (cause: black value reduction).

The display is now configured for optimum performance with the installed graphics card. If you are still not satisfied with the light density, you can increase the black and white values further by adjusting the backlighting in the OSD menu.

CAUTION
A permanently higher setting for the backlighting may reduce the brightness performance Please note that a permanently higher setting for the backlighting results in a more rapid reduction in the brightness performance toward the end of the service life.

See also

Menu functions (Page 40)

7.4.5 Display adjustment - LUT

LUT Choice
Lut Backlight command On
Select display function 1
LUT Model Lmin Lmax
1 CRT 0 0
2 DICOM 0 0
3 CIE 1976 0 0
4 Linear 0 0
5 Linear 0 0
Dynamic help for keypad function

Figure 7-2 LUT

The LUT values saved in the display can be changed or updated using SMfit® Total Care.

You can choose between five different LUT values in this menu. The values saved in the display are shown in a table in the OSD window.

More information

For further details, see the SMfit® Total Care operating instructions.

See also

Menu functions (Page 40)

7.4.6 Display adjustment - Force mode

7.4.6.1 Introduction

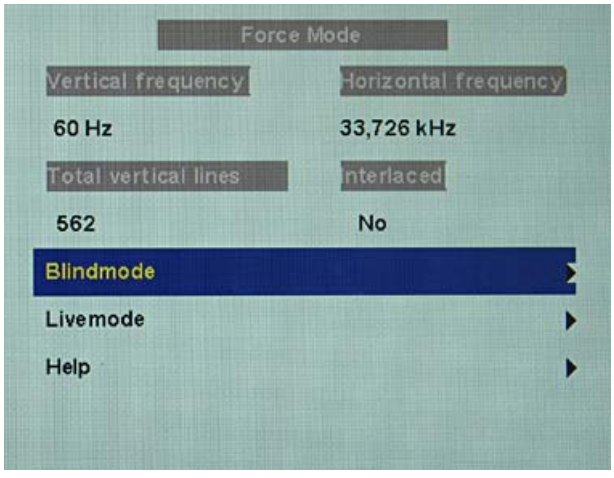


Figure 7-3 Force Mode

NOTICE
"Force Mode" is an engineering tool Force Mode is only used to determine exotic and unknown timings. Using these data, an unknown timing can be implemented in the monitor.

7.4.6.2 Foreword (a number of useful points to facilitate understanding of timing and the various types of timing)

Scanning in the interlaced and non-interlaced procedures

There are two different scanning systems. They differ in the technology used to display the image on the screen TV signals and displays which are compatible with them are normally set to the interlaced procedure, computer signals and displays compatible with them are normally set to the non-interlaced procedure. These two formats are not compatible; one of them must first be converted before the signals can be processed together. In the case of interlaced scanning, each image is divided into two separate fields. An image therefore comprises two fields. An interlaced image is output on the screen in two scans. The horizontal lines of the first field are scanned first, and then, again starting at the top of the image, the horizontal lines of the second field are scanned between the first set of lines. Field 1 consists of the lines 1 to 262 1/2, and field 2 of the lines 262 1/2 to 525. Only a few lines are displayed at the top and bottom of each field.

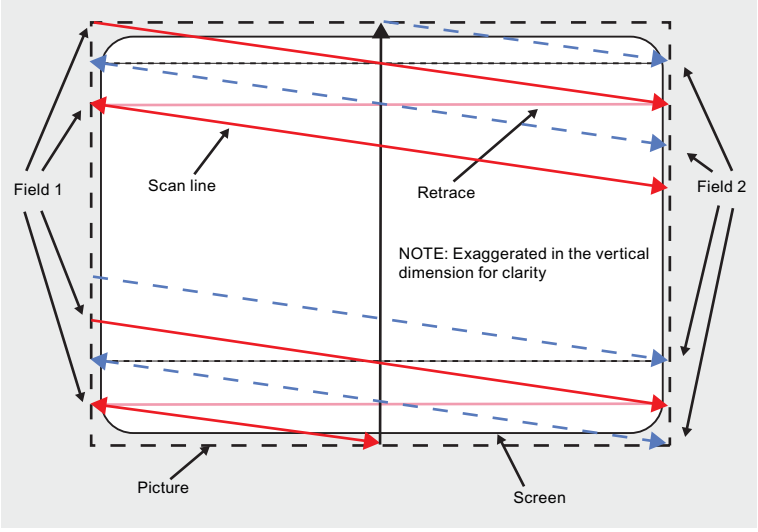


Figure 7-4 Interlaced scanning system

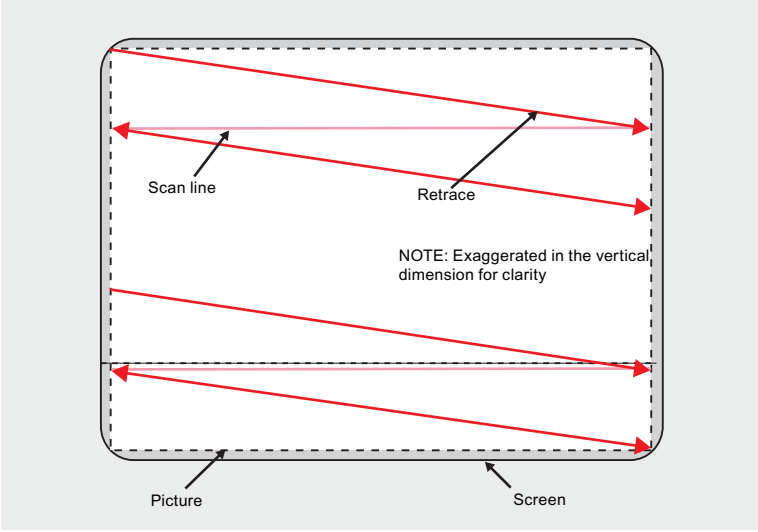


Figure 7-5 Non-interlaced scanning system

A non-interlaced image is output on the screen in that all horizontal lines are scanned from top to bottom in one scan.

Horizontal timing diagram (the vertical timing diagram is identical)

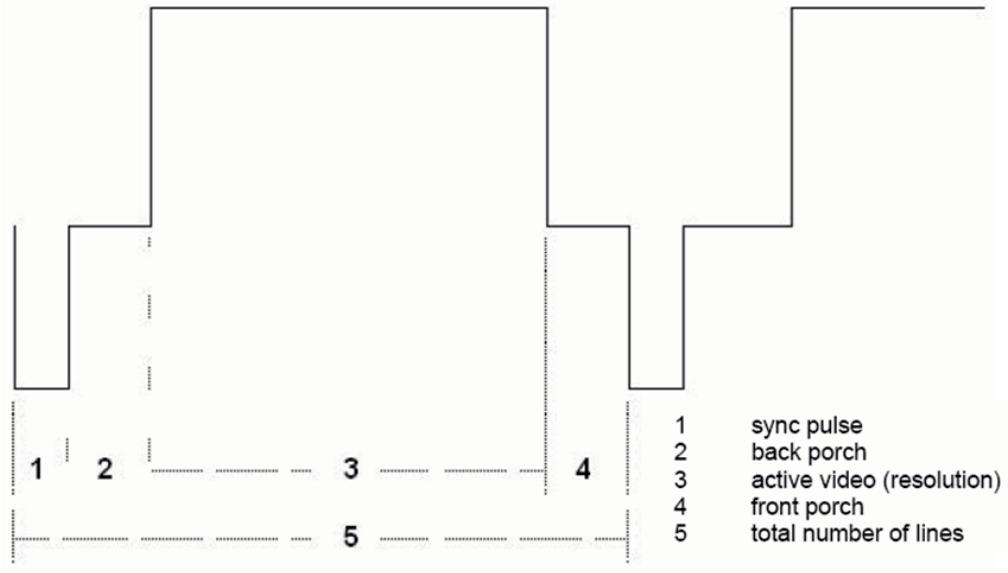


Figure 7-6 Timing diagram

Force Mode menu	Timing diagram
Horizontal resolution	3 - Active Video (resolution horizontal)
Vertical resolution	3 - Active Video (resolution vertical)
Total horizontal lines	5 – Total number of lines (horizontal)
Horizontal blank pixels	4 – Front Porch (horizontal)
Vertical blank pixels	4 – Front Porch (vertical)

7.4.6.3 Name equivalence for the Force Mode menu

Blind mode

The setting values must be known in Blind mode, and these can then be entered. See "Blind mode" (Page 68).

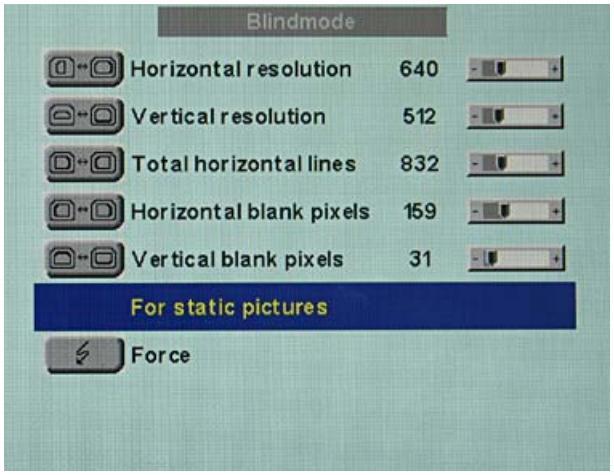


Figure 7-7 Blind mode menu

Live mode

Timings whose setting values are unknown can be set step-by-step in Live mode using test patterns. The changes in the test pattern are output live on the display. See "Live mode" (Page 70).

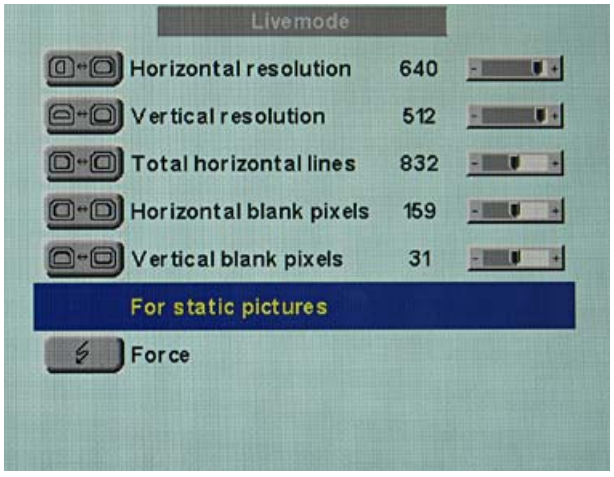


Figure 7-8 Live mode menu

Note

Various factory-set timings are saved in the display. As soon as a video signal is connected, an appropriate timing is searched for. During this phase, "Auto In Process" is displayed. These timings are compatible with the standard video signals provided by current graphics cards.

If no image or only an unclear image is displayed on the screen, the signal is outside the standard ranges. Such signals frequently occur with older medical equipment. Such a timing can be set using the Force Mode functions.

In many cases, the unknown timing will be correctly displayed without having to use Force Mode. This is possible because a large number of known timings are saved in the display.

Force Mode timings can also be saved in the Custom settings. Thus up to five further Force Mode timings are available.

Only one timing can be saved in Force Mode itself.

7.4.6.4 Blind mode

Note

"Blind mode" is used to enter known or already determined timing data.

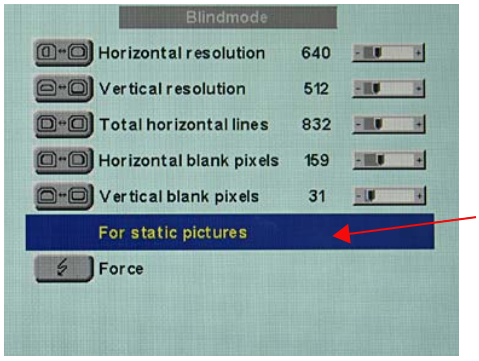
"Live mode" should be used to set unknown timing data step-by-step.

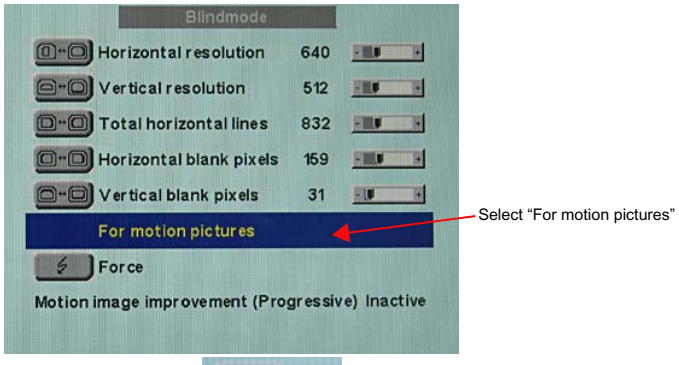
NOTICE
Saving of data always with "Force"
The timing data are only entered into memory by the "Force" command, and the image is displayed with the new parameters.

Enter known timing data and fine adjustment

1. Connect complete test pattern with clearly defined frame (e.g. SMPTE image).
2. Menu → Service level 2 → Force Mode → Blind mode.
3. Enter the timing data into the individual input fields using the Menu, Up and Down buttons.

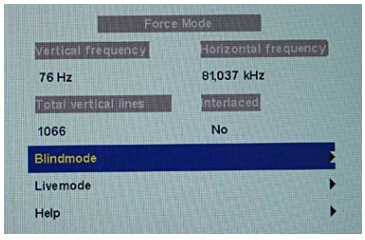
4. Select either "**For static pictures**" or "**For motion pictures**" in line 6 in the "Blind mode" menu using key 2.





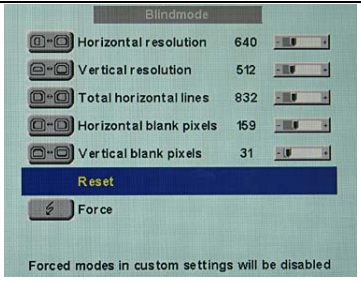
5. Execute "Force" command using key 2.

Note



For progressive timings with an image refresh rate greater than 60 Hz, only the item "For static pictures" or "Reset" can be selected in line 6 in the "Blind mode" menu.

NOTICE



If the "Reset" setting is selected, all learned values are deactivated in the current Force Mode window.

7.4.6.5 Live mode

Moderate picture quality, timing not detected?

If a timing is not detected by the display or if the image is not satisfactory, a fine adjustment can be carried out using "Live mode" or "Position/Zoom" and "Frequency/Phase".

"Live mode" is used for step-by-step approximation of an unknown timing.

Note

All settings to be carried out in this chapter are executed in "Live mode".
All settings in "Live mode" must be carried out with the zoom factor "1 to 1" ("Position/Zoom" menu).

Note

Enter known values

- If some of the timing data are already known, for example the resolution, these should first be entered in "Blind mode" in order to simplify the next steps.
- If the resolution is known, it can be used for the approximation of "Horizontal lines (total)". The following applies: "Horizontal lines (total)" > "Horizontal resolution". If, when setting "Horizontal lines (total)", the "Horizontal resolution" is larger, the latter must be reduced. A larger "Horizontal resolution" can result in the image being split vertically.

NOTICE
Saving of data always with "Force"
The timing data are only entered into memory by the "Force" command, and the image is displayed with the new parameters.

Sequence for setting a timing

1. Determine start values using autofunction
2. Optimize scanning frequency
3. Optimize geometry and resolution

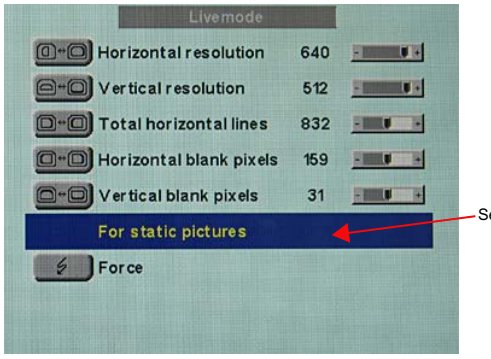
Step-by-step instructions for setting a timing can be found in the next three sections.

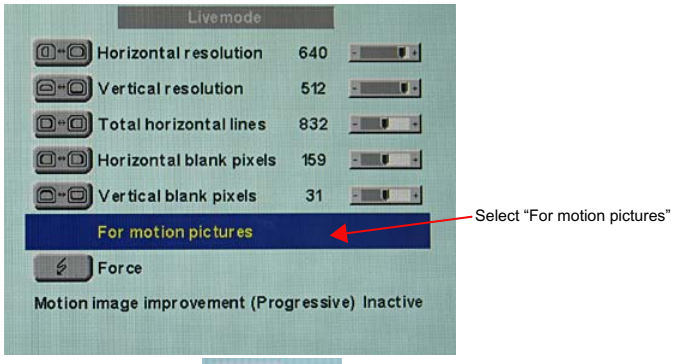
Determine start values using autofunction

The following commands can be used to trigger automatic determination of the timing data, and provides rough approximation of the applied timing.

1. Connect complete test pattern with clearly defined frame (e.g. SMPTE image).
2. Menu → Service level 2 → Force Mode → Live mode.

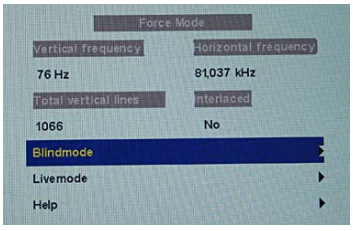
3. Select either "**For static pictures**" or "**For motion pictures**" in line 6 in the "Live mode" menu using key 2.





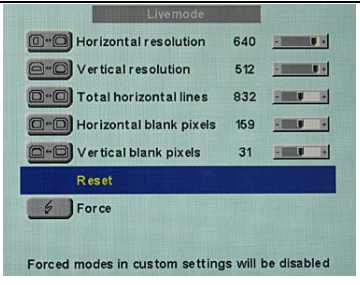
4. Execute "Force" command using key 2.

Note



For progressive timings with an image refresh rate greater than 60 Hz, only the item "For static pictures" or "Reset" can be selected in line 6 in the "Live mode" menu.

NOTICE

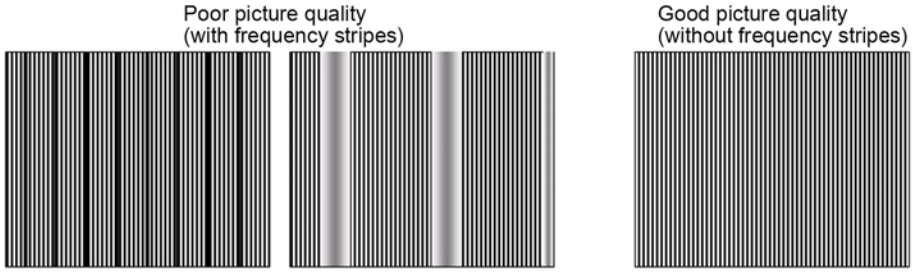


If the "Reset" setting is selected, all learned values are deactivated in the current Force Mode window.

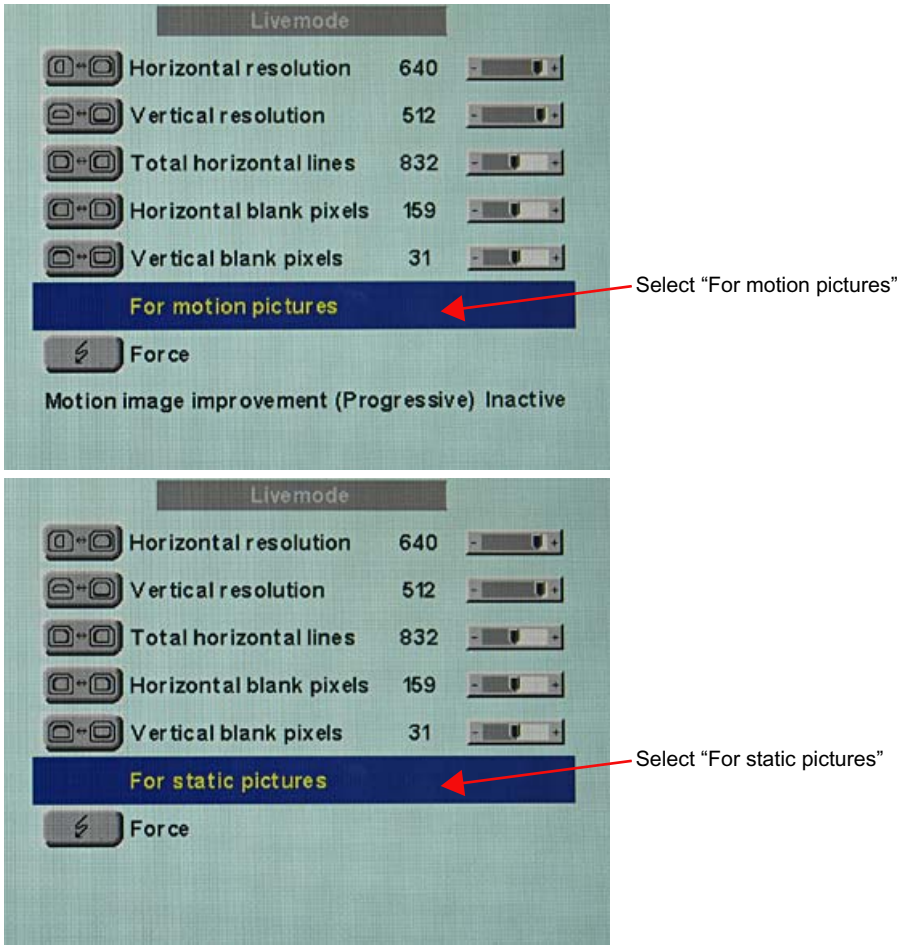
Optimize scanning frequency

The correct signal frequency must now be set ("Horizontal lines. (total)").

1. In order to set "Horizontal lines (total)" correctly, it is best to use an SMPTE and a pixel on/pixel off test pattern. If the test patterns are not available, you can use an image with clearly defined frame and a line written "lllllll" for the setting. Optimize the signal frequency such that no interferences are present in the picture. If the interval between the interferences becomes larger, and these therefore also become fewer, you are moving the slider in the correct direction.



2. If you reach the limit of the control range with the slider, you must carry out the "Force" command with the selection "**For static pictures**" or "**For motion pictures**". The current setting is then saved, and the slider set to the center of the control range. Once you have set the signal frequency optimally, you can continue with the description.



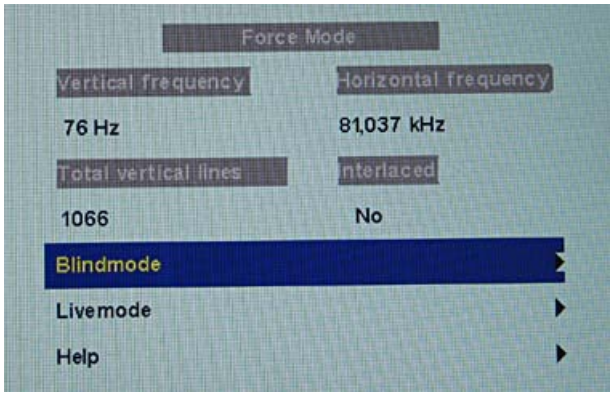
Note

Setting limit reached (applies to all settings in Force Mode!)

- Since the resolution and scanning frequency can only be set within limits, the "Force" function must be carried out when the setting limit is reached in order to continue with the setting process. In this manner, the slider for the setting range is again set in the center.

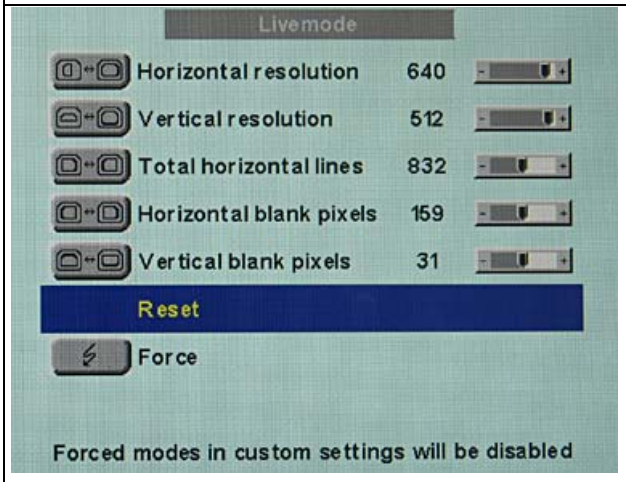
  It may be necessary to repeat this process several times!

Note



For progressive timings with an image refresh rate greater than 60 Hz, only the item "For static pictures" or "Reset" can be selected in line 6 in the "Live mode" menu.

NOTICE



If the "Reset" setting is selected, all learned values are deactivated in the current Force Mode window.

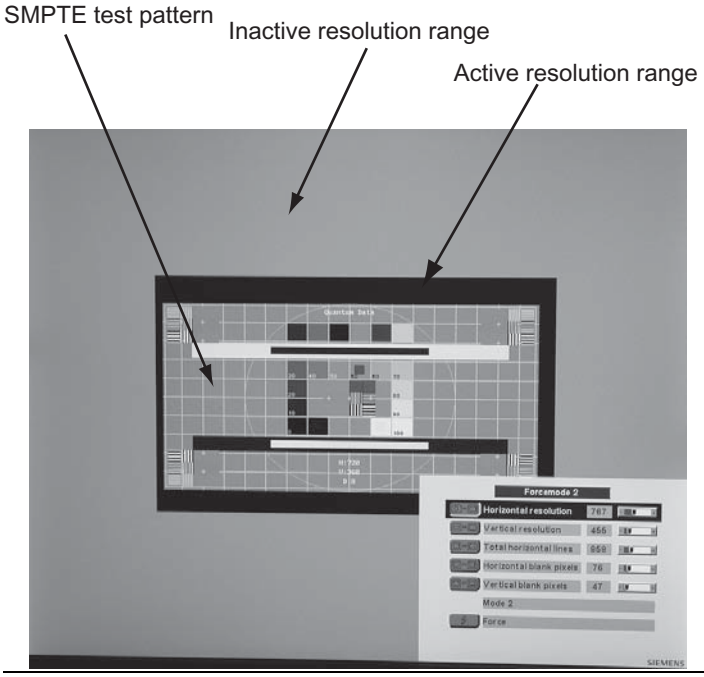
Optimize geometry/resolution

Note

Active and inactive resolution range

The active resolution range is defined by the values of the "Horizontal resolution" and "Vertical resolution" input fields. This range is displayed in black and centric on the display.

The inactive resolution range is the unused range between the active resolution and the maximum display resolution of 1280 x 1024. This range is displayed in Force Mode in gray (with monochrome displays) or blue (with color displays).



To match the active resolution range to the actual video signal resolution, you must carry out the following steps:

1. Select either "**For static pictures**" or "**For motion pictures**" in line 6 in the "Live mode" menu using key 2.
2. Connect complete test pattern with clearly defined frame (e.g. SMPTE image).
3. Use the "Horizontal blank pixels" input field to shift the left edge of the SMPTE image pixel-exact to the left internal border of the gray/blue area.

   Note

   Gray/blue area not visible

   If no gray/blue area is visible on the left and right sides of the image, reduce the "Horizontal resolution" until the gray/blue area becomes visible.

4. Correct the values in the "Horizontal resolution" input field until the right internal border of the gray/blue area is pixel-exact at the right edge of the SMPTE image.

5. Use the "Vertical blank pixels" input field to shift the top edge of the SMPTE image pixel-exact to the top internal border of the gray/blue area.

Note

Gray/blue area not visible

If no gray/blue area is visible on the top and bottom sides of the image, reduce the "Vertical resolution" until the gray/blue area becomes visible.

6. Correct the values in the "Vertical resolution" input field until the bottom internal border of the gray/blue area is pixel-exact at the bottom edge of the SMPTE image.
7. Execute "Force"

command using key 2.

Timing successfully set

The unknown timing has been successfully set, you can now exit the OSD menu. The display will recognize the newly set timing and set it as saved whenever connected in the future.

Note

New timings need only be learned and saved once. The display subsequently recognizes the timings automatically.

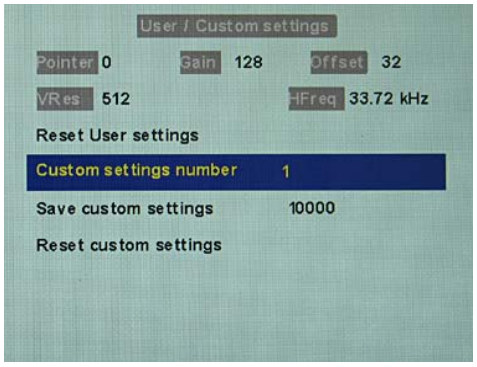
The desired zoom factor can be selected in "Live mode" when all settings have been completed.

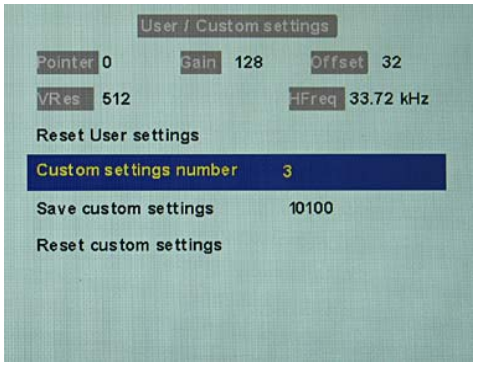
Once all settings have been carried out in Force Mode, the desired zoom factor can be selected from the "Position/Zoom" menu.

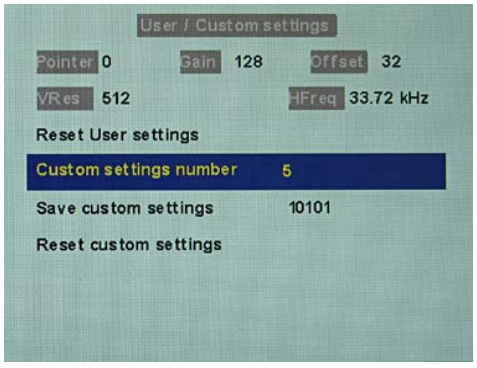
Further use of determined values

The values determined step-by-step using "Live mode" can now be copied and entered directly in further displays using "Blind mode".

Saving of several timings which have been successfully forced







1. Up to five timings can be saved in "User / Custom settings".

   Save the timings in the OSD menu "Service level 2 → User / Custom settings".
2. Select memory location using "Custom settings number".
3. Save timing by selecting "Save custom settings" and confirming with key 2.
4. The saved timing is now identified by a "1" in "Save custom settings".

   If a "3" has been selected in "Custom settings number", the third digit of "Save custom settings" is set to "1".

   Saved timings can be overwritten at any time.

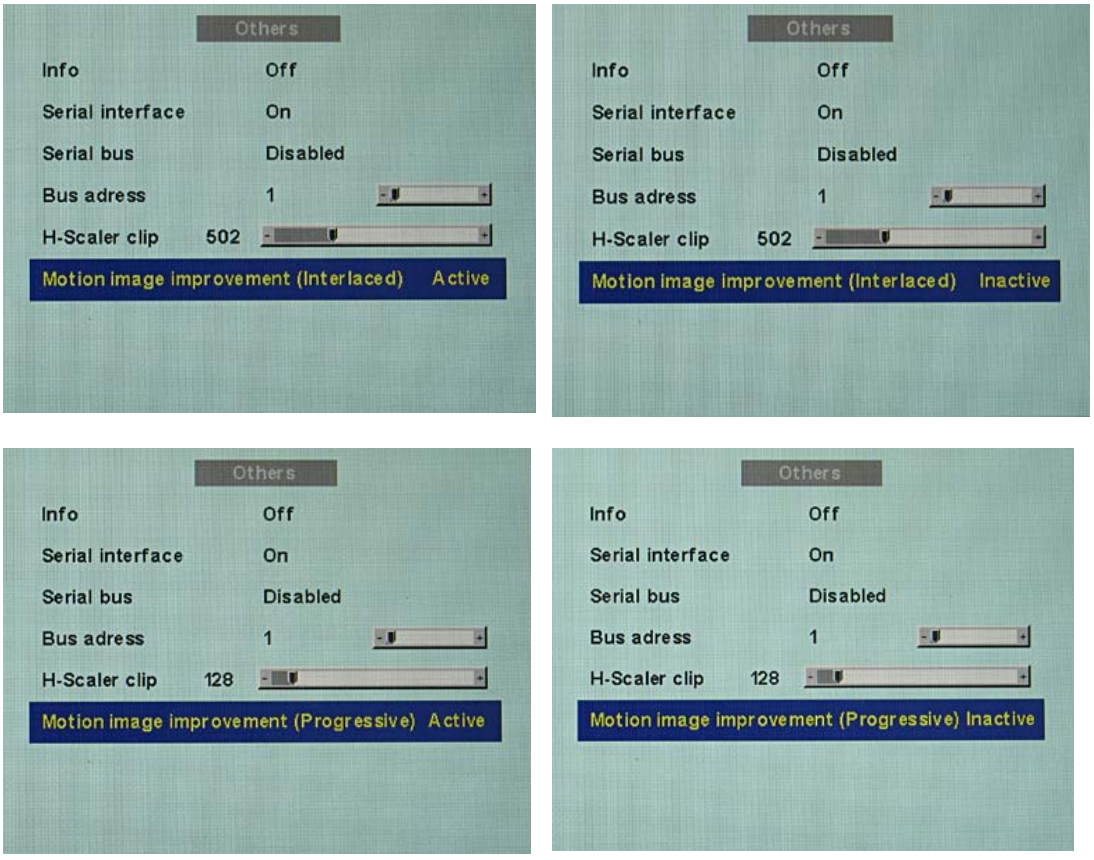
Note

Up to five timings can be saved in the menu line "Save custom settings".

7.4.6.6 Motion image improvement with interlaced and non-interlaced (progressive)

If the setting "For motion pictures" is selected and "Force" carried out in the Force Mode menu "Blind mode" or "Live mode", the menu line "Motion image improvement" is displayed with the setting "Inactive".

- If the motion image improvement is to be activated, the setting for this must be changed from "Inactive" to "Active" either in the menu "Service level 2 → Others" or in the Force Mode menu "Blind mode" or "Live mode" .



Advantages of motion image improvement with interlaced signals

NOTICE
With the setting "Motion image improvement" for interlaced signals, the sharpness settings cannot be changed in the "Others" menu. The motion image improvement would then be lost.

Using the motion image improvement, it is possible to reduce undesirable comb effects in the case of motion images of interlaced signals with PAL and NTSC resolutions connected to the VGA" and "DVI Analog" signal inputs.

Advantages of motion image improvement with non-interlaced (progressive) signals

Using the motion image improvement, it is possible to reduce undesirable staircase signals in the case of all non-interlaced signals of up to 60 Hz connected to the "VGA" and "DVI Analog" signal inputs.

NOTICE
Despite motion image improvement, staircase signals can occur with PIP images of the signal sources "S-Video" and "Composite Video". The staircase signals can occur if a signal source with motion image improvement is active in the main picture.

See also

Service level 2 functions (Page 53)

Blind mode (Page 68)

Live mode (Page 70)

Operation

8

8.1 Note for users

CAUTION
Settings must not be changed by users None of the settings may be changed on site by the user. This also applies to settings made using the display keys. These are therefore locked for certain applications. If settings have to be changed, please contact the responsible servicing department. **If keyboard is locked, contact Service department** If the keyboard is locked, contact the service department in order to unlock it. If you unlock it yourself, the warranty will no longer be valid!

8.2 Switching on the display

Following commissioning, operation is limited to switching on and off.

- Switch on the device using the power switch.

The green operation LED now lights up permanently.

See also

Troubleshooting (Page 83)

Service and maintenance

9

9.1 Cleaning

CAUTION
Device maintenance, cleaning and disinfecting • The front panel is extremely sensitive to mechanical damage. Avoid all scratches, knocks etc.! SCD / SMD 19102 CP versions with protective glass are considerably more susceptible to this kind of damage. • SCD / SMD 19102 versions, without protective glass: Remove water drops immediately; extended contact with water discolors the surface. • Clean the front panel when dirty using a microfiber cloth and, if necessary, a cleaning agent. Only clean housing parts using the recommended cleaning agents. • The entire display must only be disinfected using the tested disinfectants.

CAUTION
Remove all residual cleaning agents immediately • Some cleaning agents leave residue (streaks) on the surface which can easily be removed by wiping with a damp cloth. • Remove residues of alcohol, "Cidex", "Taski DS 5001" and "Surfanios Fraicheur Citron" from the surface immediately. Residue of these cleaning agents on the surface often causes permanent streaks.

Recommended cleaning agents and disinfectants:

Agent class	Tested cleaning agents and disinfectants:	Further examples
Alcohol	• Ethyl alcohol (96%) • Isopropyl alcohol (70%) • 0.5% chlorhexidine in isopropyl alcohol (70%)	• Hospiset cloth • Mikrozid liquid
Aldehyde	• Melsitt • Cidex • Cidex (2.4% glutaraldehyde solution)	• Aldasan 2000 • Kohsolin • Gigasept FF
Chlorine derivatives	• Terralin • Sodium hypochlorite (10%)	Quartamon Med

Agent class	Tested cleaning agents and disinfectants:	Further examples
Disinfectants	• TaskiDS5001 (Diverseylever Labs) • Morning Mist • Surfanios Fraicheur Citron (Anios Labs) • Misty Multi-Purpose Disinfectant Cleaner I and II • Misty Disinfectant and Deodorant RTU (Amrep labs) • Virex II 256 • Precise Hospital Foam Cleaner Disinfectant • "Green Soap" USP • Ovation • Formula 409 • Fantastik • WexCide	
Guanidine derivatives	Lysoformin	
Quaternary compounds	Incidur spray, undiluted	
Standard household washing-up liquid	Tempo	Fairy Ultra, Pril, Palmolive
Pyridine derivatives	Activ spray, undiluted	
Water	• Tap water • Distilled water • 1.6 % water-based ammonia solution	

Impermissible cleaning agents and disinfectants:

Agent class	Tested cleaning agents and disinfectants:
Peroxide compounds	Perform Dismozon pur

These cleaning agents and disinfectants can bleach the paint after a longer period of application.

Troubleshooting

10

Fault	Cause	Remedy
Monitor displays no picture, Operation LED off	Fuse is defective	Inform service personnel
	Power cable is not inserted or incorrectly inserted.	Connect power cord
Monitor displays no picture, Operation LED flashes green	No video signal	Check video cable
	Video source is not outputting a video signal	Check video source
Fuzzy picture, interference in vertical lines	Scanning frequency or phase incorrectly set	Adjust frequency and phase
DPMS ON mode: LED flashes green, then orange	Loose connections	Plug in cables properly and secure them
DPMS OFF mode: LED flashes green	Faulty cable	Replace cable
Status LED flashes orange, temperature warning appears on the screen	Overtemperature threshold: The temperature limit has been exceeded	Check the following: • The temperature limit is not set correctly: – Check the setting in the OSD menu (Service level 2). • Room temperature is too high • The cooling fins on the housing are covered. • Non-compliance with the spacing requirements on installing the display. • The display is close to a heat source.
Status LED flashes red, no image appears on the display	Overtemperature threshold: Temperature for automatic shutdown has been reached. • The display will shut down automatically after 30 minutes. • The display will switch on again as soon as the temperature falls sufficiently.	
Image has no contrast	The video source is only transmitting a green signal	In the OSD menu, switch over from "RGB" to "MONO"
The image cannot be shifted horizontally with reference to the panel	Synchronization not OK	Set maximum window size and perform "Auto adjust"

Other information output via two-color LEDs

LED	Display status
LED orange	No fault; "Power down" was switched on and activated
LED green	Video signal recognized, no fault

Technical specifications

11

Applicability of technical specifications

All technical specifications apply after a warming-up period of two hours.

11.1 Graphic display

Type	Color & monochrome, IPS, TFT panel
Screen size	376 mm x 301 mm
Screen diagonal	19" (48 cm)
Native resolution	1280 x 1024 (full-screen format)
Pixel arrangement	3 subpixels
Pixel spacing	0.294 mm x 0.294 mm
Contrast ratio	
• SCD series	• Typically 600:1 • At least 400:1
• SMD series	• Typically 900:1 • At least 600:1
Brightness	
• SCD series	• Typically 280 cd/m² • Min. 230 cd/m²
• SMD series	• Typically 1000 cd/m² • Min. 800 cd/m²
Horizontal viewing angle	At least ± 85°
Vertical viewing angle	At least ± 85°
Protective glass	**For SCD / SMD 19102 CP only:** Safety glass, non-reflective both sides
Backlight	6 CCFT (cold cathode fluorescent tubes)
Lifetime of backlight	Typically 45,000 hours for CCFT (applies to an ambient temperature for the backlight of 25 °C)

See also

Menu functions (Page 40)

11.2 Voltage supply

Mains connection	Non-heating appliance socket
Line supply voltage	100 V ... 240 V AC
Miniature fuse	2 x 3.5 A, quick-blow
Line frequency	50 ... 60 Hz (± 5 %)
Power consumption	< 58 W

11.3 Electronics

Multi-standard technology	Video modes with resolutions less than 1280 x 1024 can be expanded to the TFT resolution, and thus utilize the full display area (like multi-sync CRTs) Likewise, resolutions above 1280 x 1024 can be reduced and then displayed. Interpolation artifacts must be expected when displaying images with a resolution other than 1280 x 1024. (Caution: If the timing is frame-buffered or frame-synchronized, the picture information may be lost; the grayscales - the color hues for color images - are also reduced and may be visible).
Timing recognition	H frequency, V frequency, interlaced, number of horizontal lines

11.4 Inputs/Outputs

Analog signal input

RGB input, H/C-Sync input and V-Sync input	via 15-pin Sub-D connector (female), any polarity **SMD series only:** Over 3 BNC sockets (green, horizontal sync, vertical sync)
DVI input	**SCD series only:** Over DVI-I socket, (analog pins are used)
RGB signal	• Video level: 0,5 ... 1.0 V_{pp} • Sync level: TTL-compatible
SoG signal	• Video level: 0,5 ... 1.0 V_{pp} • Sync level: 0,2 ... 0.3 V_{pp}

Digital signal input

DVI input	Over DVI-I socket, single link
DDC	via DVI

Video input

S-Video	Via 4-pin mini-DIN socket
Composite	Over 1x BNC socket
Composite & S-Video	• Video level: 0,5 ... 1.4 V_{pp} • Sync level: 0,2 ... 0.3 V_{pp}
Standards	PAL (625 Z / 50 Hz) NTSC (525 Z / 60 Hz)

Analog signal output

SoG signal	• Video level: 0.5 ... 1.0 V_{pp} • Sync level: 0.2 ... 0.3 V_{pp}

Serial interface

RS 232	via RJ 11 socket (female) or 6-pin mini-DIN socket

11.5 Control and connection elements

Front	• Four buttons for OSD menu • Operation LED
Rear side	• 1x power connection socket • 1x DVI socket • 1x 15-pin 3-row Sub-D socket • 3x BNC sockets (SMD series only) • 1x BNC socket • 1x 4-pin mini-DIN socket • 2x RS 232 sockets (RJ11) • Voltage source for connection of external devices (5 V/1 A) • 2x 75 Ω/10 kΩ switch loop for H and V
Rear panel (accessible without detaching connector panel cover)	• 1x power switch • 1x RS 232 socket (6-pin mini-DIN socket)

11.6 Mechanical design

Housing components	ABS
Protective glass	**For SCD / SMD 19102 CP only:** Safety glass, non-reflective both sides
Visible screen area	Approx. 376 x 301 mm
Ventilation openings	In rear panel
Degree of protection	• IP20 in accordance with DIN 40050 • IP22 at front only for SCD / SMD 19102 CP
Connector panel	On rear panel, under cover
Weight in kg	
• SCD / SMD 19102 C (without stand)	6.4 kg (± 0.3 kg)
• SCD / SMD 19102 CP (without stand, with front pane)	7.0 kg (± 0.3 kg)
• SCD / SMD 19102 D (without stand)	11.4 kg (± 0.3 kg)
Dimensions (W x H x D) in mm	
• SCD / SMD 19102 C (without stand)	422.5 x 348.5 x 95
• SCD / SMD 19102 CP (without stand, with front pane)	422.5 x 348.5 x 95
• SCD / SMD 19102 D (without stand)	314 x 348.4 ... 546.5 x 279 *

* Corresponds to a possible height adjustment of 100 mm.

11.7 Climatic conditions

Operation

Temperature range	5 °C ... 40 °C ambient temperature
Temperature gradient	Max. 5 °C/h, no condensation
Air pressure	1053 ... 540 hPa

Transport and storage (packed)

Temperature range	-20 °C ... +60 °C ambient temperature
Temperature gradient	Max. 5 °C/h, no condensation
Air pressure	1053 ... 540 hPa

11.8 Mechanical requirements

Operation

Vibration	To EN 60068-2-6 10 ... 58 Hz at ± 0.075 mm deflection 58 ... 500 Hz at 10 m/s²
Shock	to EN 60068-2-27 (single impact) 150 m/s², 6 ms Under operating conditions, the device must not be exposed to continuous or repeated shocks.

Packed unit

Vibration	To EN 60068-2-6 5 ... 9 Hz at ± 3.5 mm deflection 9 ... 500 Hz at 10 m/s²
Shock	to EN 60068-2-27 (single impact) 250 m/s², 6 ms (in storage packaging) to EN 60068-2-29 (continuous shocks)

11.9 Safety specifications

Safety standards	EN 60601, IEC 601
Approvals	CAN/CSA - C 22.2 No. 601.1-M 90, CSA/us mark
Protection class	Protection class I
Degree of protection according to DIN 40050	IP20
Conformity	CE to MPG 93/42/EEC (Class I)

CAUTION

Subsequent mounting of a stand

The SCD / SMD 19102 C and SCD / SMD 19102 CP displays are delivered without a stand. To ensure that the complete system (display and stand) complies with the EN 60601 standard, a subsequently mounted stand must also comply with the EN 60601 standard.

11.10 Electromagnetic compatibility

Interference voltage/interference noise	EN 60601-1-2
Voltage fluctuations	EN 610004-11
Burst on power cables	EN 61000-4-4 1 kV
Surge on power cables	EN 61000-4-5 1 kV symmetrical, 2 kV unsymmetrical
Static discharge on casing parts (ESD)	EN 61000-4-2 8 kV air, 4 kV contact
RFI	EN 61000-4-3 80 MHz ... 2.5 GHz, 3 V/m 80 % AM 1 kHz
Noise immunity	EN 61000-4-6 150 kHz ... 80 MHz 3 V/m 80 % AM 1 kHz
Magnetic constant fields	EN 61000-4-8 Max. 4000 A/m
Magnetic alternating fields	EN 61000-4-8 Max. 10 A/m

Dimensional drawings

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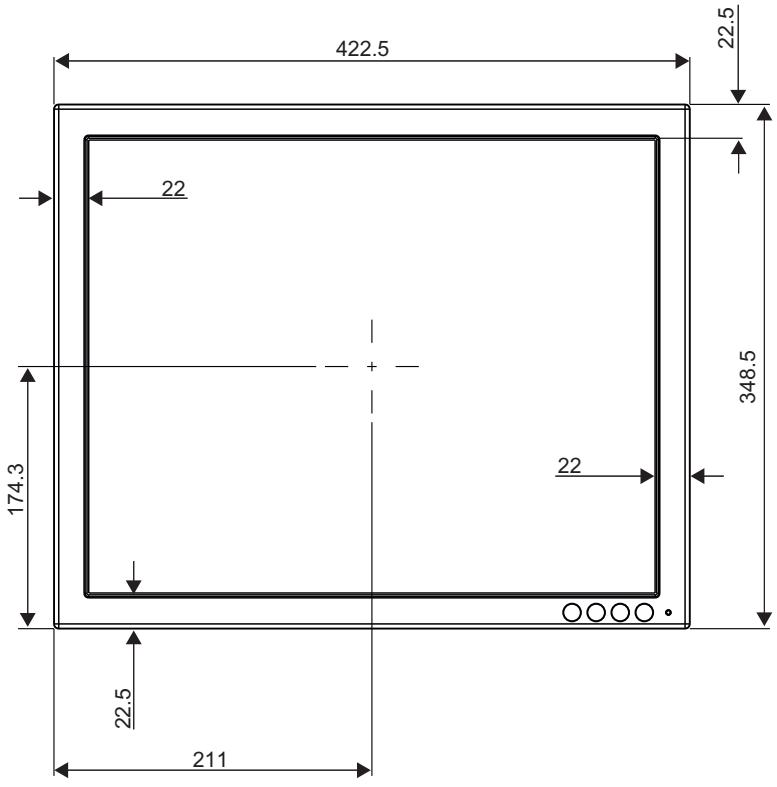
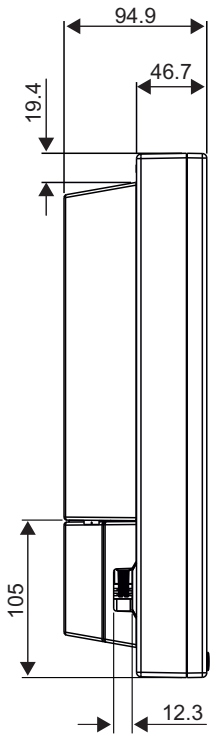
All dimensions in mm

12.1 SCD / SMD 19102 C/CP (without stand)

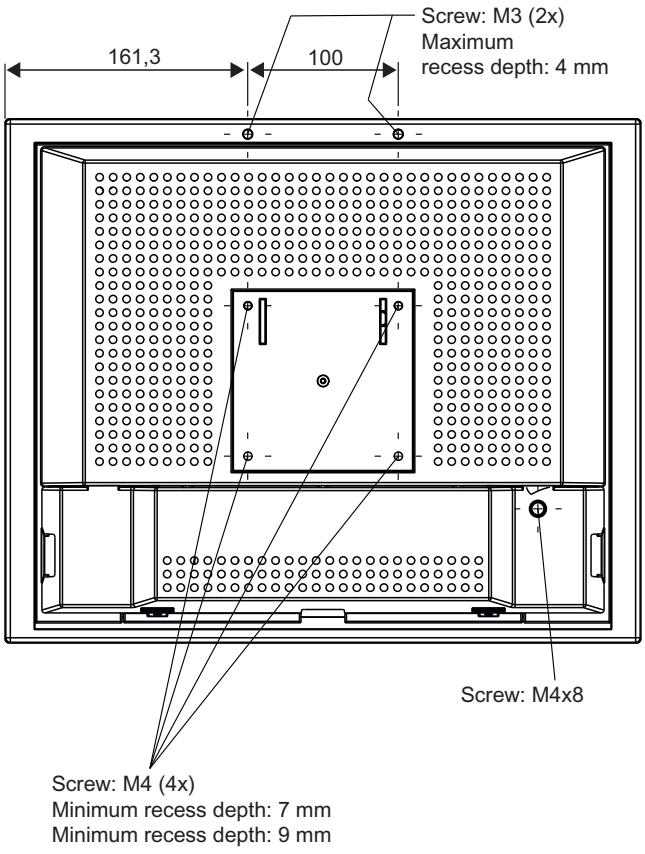
12.1.1 Front view



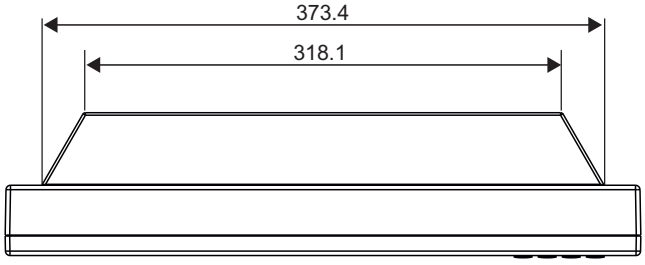
12.1.2 View from left



12.1.3 Rear view

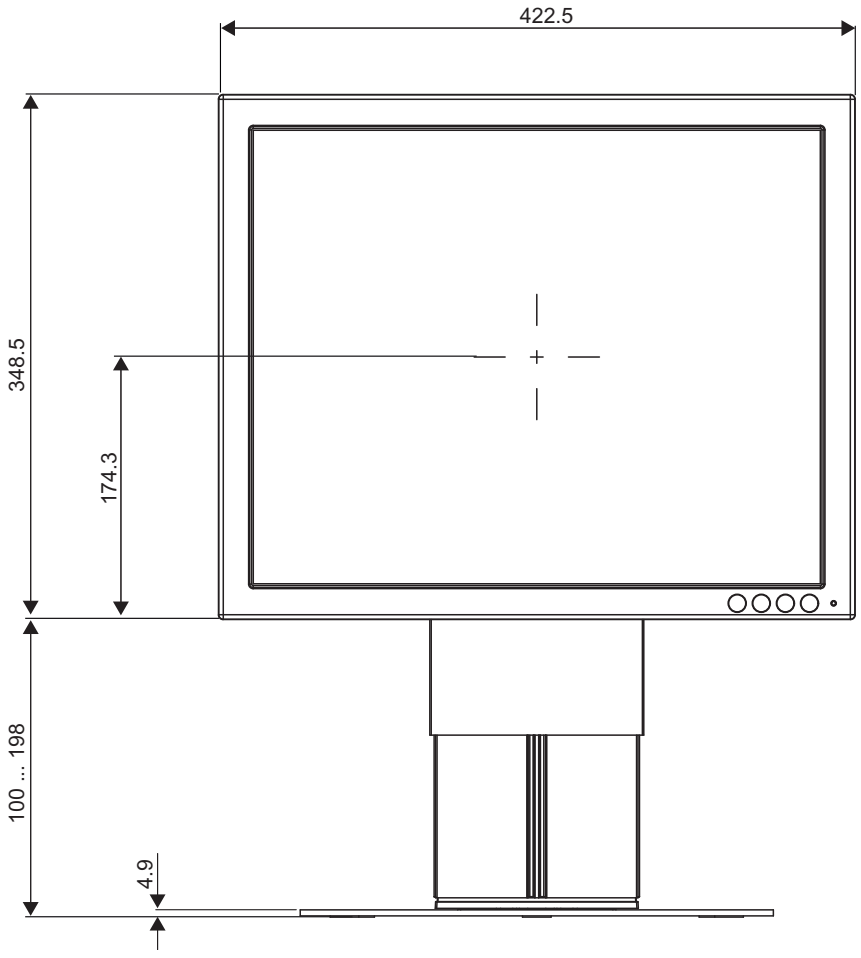


12.1.4 View from above

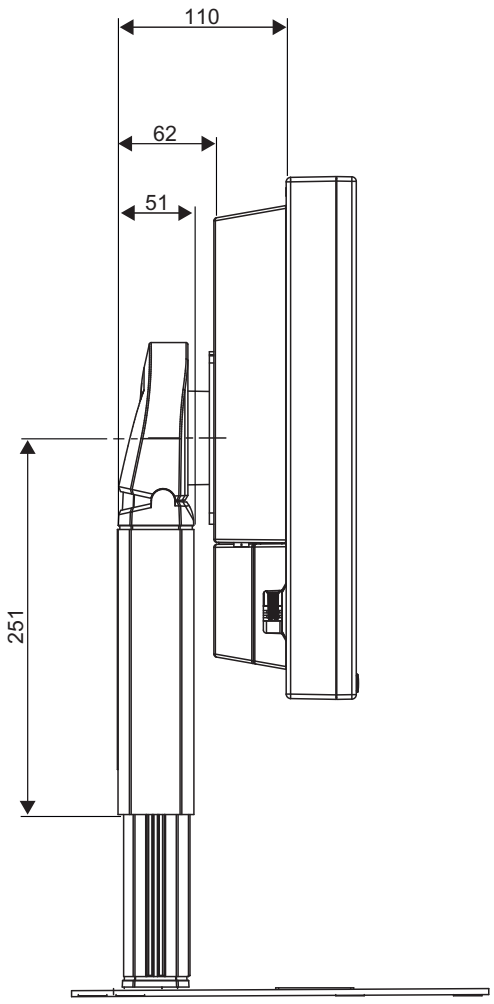


12.2 SCD / SMD 19102 D (with stand)

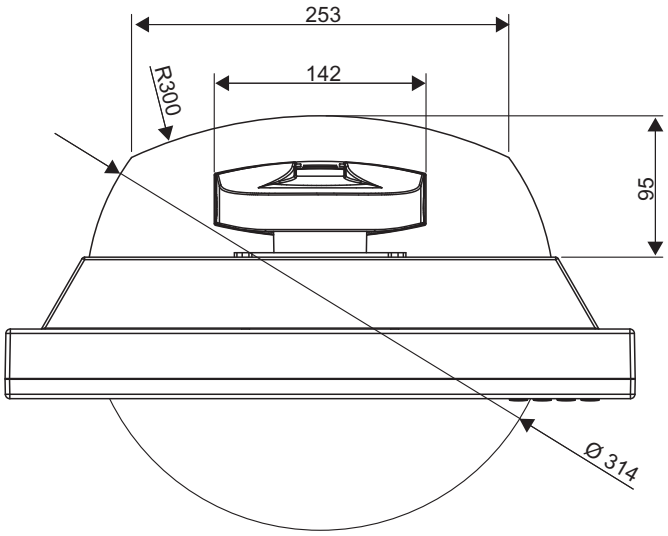
12.2.1 Front view



12.2.2 View from left



12.2.3 View from above



Accessories

13

13.1 Display stands

More information

You will find updates regarding products and accessories on our homepage:
http://www.eizo.eu

We offer different types of display stands. This means that the displays can be optimally adapted to your ergonomic requirements and they allow you to work without fatigue.

Multifunctional stand

Complete with all possible settings

- Adjustable height, inclination angle, rotation as well as rotation between portrait and landscape format.

Stand	Compatible displays	Order No.
SAB 2107 RC For displays up to 7 kg.	• SCD 17100 • SMD 18101 CS • SCD 19100 C • SxD 19102 C/D • SMD 19200 CS	6GF6988-8AA01
SAB 2110 RC For displays from 7 to 10 kg.	• SMD 18101 CP • SCD 19100 CP • SxD 19102 CP • SHD 21205 • SxD 213xx D/DP • SMD 215xx	6GF6988-8AA02

Fixed stand

With adjustable inclination.

Stand	Order No.
For displays from 17" to 19"	6GF6280-1DG
For displays from 17" to 21"	6GF6280-1DF

13.2 DVI transmission path and cable

DVI transmission path SDL 3501

NOTICE
If the display is not designed for a 5 V/1 A power supply, a power supply unit is required for the DVI transmission path.

Digital graphics connection supports the transmission of high-quality video data. Using the SDL 3501 DVI cable set from EIZO, this data can be transmitted over a distance of up to 36 m without any reduction in quality.

The transmission set comprises a receiver and a transmitter that are connected over the CAT cable. This medium is widely implemented, rugged in use and the cables are easy to connect. The plugs at each end are small enough to pass through narrow pipes

Product	Order No.
DVI transmission path SDL 3501 • 36 m without power supply unit	6GF6010-0DA36
DVI transmission path SDL 3501 P • 36 m with power supply unit	6GF6010-1DA36
DVI transmission path SDL 2501 P • 23 m with power supply unit	6GF6010-1DA23

Cables and adapters

Different cables and adapters allow problem-free integration of our displays, even in extremely complex systems.

Product	Order No.
PS2 adapter for luminance meter	6GF6980-1TB03
DVI cable, single link, 3 m	6GF6980-1TA07
BNC to VGA cable	6GF6980-1TB04
SMfit ACT®: Serial bus cable set / 3 LCD	6GF6980-1TA08
UMC-201, USB serial converter	6GF6980-8WG15

13.3 Calibration tools

SMfit® Web QA software

Professional display adjustment tool with automated stability control, log file tracking, LUT selection and calculation and different modes of use.

Even more functions are available with our high-precision photometers (serial spot meter and advanced serial luminance meter) which feature interfaces to our software.

Our additional teleservice and control software offers you a worldwide tracking system and asset management system that gives you open access to all your plants throughout the world.

Name/description	Order No.
SMfit® Total Care with SSM and license key	6GF6980-7DA31
SMfit® Total Care with ASLM and license key	6GF6980-7DA32
SMfit® Total Care with ASLM, license key and USB serial converter	6GF6980-7DA33 (including additional USB serial converter)
SMfit® Site Manager	6GF6980-7DB31
SMfit ACT® Calibration 3.4 with SSM	6GF6980-7DA02
SMfit ACT® Calibration 3.4 with ASLM	6GF6980-7DA11
SMfit ACT® Calibration 3.4 with ASLM and USB serial converter	6GF6980-7DA12
SMfit ACT® Remote 3.4	6GF6980-7DB11

13.4 Graphics cards

EIZO Display Controller cards are part of our strategy of supplying everything from a single source.

These cards have been tested with the display and the quality assurance software SMfit® Total Care. Long-term availability provides further assurance of rugged interfaces and minimal installation outlay.

Name/description	Order No.
SDG 1612 D	6GF6632-2TP02
SDG 3212 D (from Q2, 2009)	6GF6635-2TM10

Appendix

A

A.1 Warranty

Opening of the housing, or electrical or mechanical changes on or in the device, result in cancellation of the warranty. For warranty details, please contact the sales partner from whom you purchased the product. These warranty conditions are neither extended nor limited by the contents of this user manual.

A.2 Repairs

Please contact the sales partner from whom you purchased the product.

A.3 Environmental protection

Please observe all local requirements and laws pertaining to the disposal of displays.

A.4 Accessory devices

Devices connected to the display (e.g. PC) must also comply with the relevant safety specifications.

A.5 Contact

Support during installation and for technical questions:

http://www.eizo.eu

Global Hotline support

EIZO Display Technologies	
Online support inquiry:	http://www.eizo.eu
China (Chinese)	800 8100687
International (English)	+49 9131 7 31798
International (German)	+49 9131 7 31688
USA (English)	+1 (888) 900-8383

A.6 China RoHS (Restriction of Hazardous Substances)

LCD Display 液晶显示器
型号 Model: 6GF621#-2E$## (#=0..1 ; $=A..Z ; ##=00..99)

根据 SJ/T11364-2006《电子信息产品污染控制标识要求》特提供如下有关污染控制方面的信息。
The following product pollution control information is provided according to SJ/T11364-2006 Marking for Control of Pollution caused by Electronic Information Products.

电子信息产品污染控制标志说明 Explanation of Pollution Control Label

该标志表明本产品含有超过中国标准 SJ/T11363- 2006《电子信息产品中有毒有害物质的限量要求》中限量的有毒有害物质。标志中的数字为本产品的环保使用期，表明本产品在正常使用的条件下，有毒有害物质不会发生外泄或突变，用户使用本产品不会对环境造成严重污染或对其人身、财产造成严重损害的期限。单位为年。
为保证所申明的环保使用期限，应按产品手册中所规定的环境条件和方法进行正常使用，并严格遵守产品维修手册中规定的定期维修和保养要求。
产品中的消耗件和某些零部件可能有其单独的环保使用期限标志，并且其环保使用期限有可能比整个产品本身的环保使用期限短。应到期按产品维修程序更换那些消耗件和零部件，以保证所申明的整个产品的环保使用期限。
本产品在使用寿命结束时不可作为普通生活垃圾处理，应被单独收集妥善处理。
This symbol indicates the product contains hazardous materials in excess of the limits established by the Chinese standard SJ/T11363-2006 *Requirements for Concentration Limits for Certain Hazardous Substances in Electronic Information Products*. The number in the symbol is the Environment-friendly Use Period (EFUP), which indicates the period during which the toxic or hazardous substances or elements contained in electronic information products will not leak or mutate under normal operating conditions so that the use of such electronic information products will not result in any severe environmental pollution, any bodily injury or damage to any assets. The unit of the period is "Year".
In order to maintain the declared EFUP, the product shall be operated normally according to the instructions and environmental conditions as defined in the product manual, and periodic maintenance schedules specified in Product Maintenance Procedures shall be followed strictly.
Consumables or certain parts may have their own label with an EFUP value less than the product. Periodic replacement of those consumables or parts to maintain the declared EFUP shall be done in accordance with the Product Maintenance Procedures.
This product must not be disposed of as unsorted municipal waste, and must be collected separately and handled properly after decommissioning.

有毒有害物质或元素的名称及含量 Name and Concentration of Hazardous Substances

部件名称 Component Name	有毒有害物质或元素 Hazardous substances' name					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
液晶纯平屏幕 LCD Flat Screen	X	X	O	O	O	O
背光逆变器 Backlight Inverter	O	O	O	O	O	O
控制板 Controller Board	O	O	O	O	O	O
电源 Power Supply	O	O	O	O	O	O
其他 电路板 Other Circuit Boards	O	O	O	O	O	O
其他（电缆等） Others (cables, etc.)	O	O	O	O	O	O
机架、底盘 Housing, Chassis	O	O	O	O	O	O
附件（信号电缆、输电线等） Acessories (signal cable, power line, etc.)	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下
X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求

- 此表所列数据为发布时所能获得的最佳信息.
- 由于缺少经济上或技术上合理可行的替代物质或方案，此医疗设备运用以上一些有毒有害物质来实现设备的预期临床功能，或给人员或环境提供更好的保护效果。

O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.
X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006

- Data listed in the table represents best information available at the time of publication.
- Applications of hazardous substances in this medical device are required to achieve its intended clinical uses, and/or to provide better protection to human beings and/or to environment, due to lack of reasonably (economically or technically) available substitutes.

产品中有毒有害物质或元素的名称及含量 Table of hazardous substances' name and concentration.

The flat lamps of the LCD Flat screen for medical backlights use a lead-containing solder glas. There is no risk, because the substance is integrated in the glass of the flat lamp.The flat lamps of the LCD Flat screen for medical backlights contain Mercury. The Mercury is inside the CCFL tubes.

See also

Internet (http://www.eizo.eu)

A.7 Disposal of materials containing mercury

⚠ WARNING

Disposal of product components that contain mercury must be in accordance with the applicable regional or national legislation.

This product consists of devices that may contain mercury, which must be recycled or disposed of in accordance with local, state, or country laws. (Within this system, the backlight lamps in the monitor display contain mercury)

Ce produit comporte des composants susceptibles de contenir du mercure devant être recyclé ou éliminé conformément aux lois locales, régionales ou nationales en vigueur. (dans le présent système, les lampes de rétro-éclairage de l'écran contiennent du mercure)

Dieses Produkt enthält quecksilberhaltige Schaltungen, die gemäß den regionalen oder nationalen gesetzlichen Bestimmungen zu recyceln oder zu entsorgen sind. (In diesem System ist Quecksilber in den zur Hinterleuchtung des Displays verwendeten Lampen enthalten)

该产品中涉及使用含汞类设备，这些设备的回收、处理必须符合当地、该国家与地区的法律要求。（该系统中，显示器的背光灯含汞。

Tento výrobek je složen ze zařízení, která mohou obsahovat rtuť, jejíž recyklace nebo likvidace musí proběhnout v souladu s místními a státními zákony. (V tomto systému je rtuť obsažena v zadních lampách kontrolního displeje.)

Dette product består af enheder, der kan indeholde kviksølv, som skal genbruges eller bortskaffes I henhold til locale eller nationale love. (I dette system indeholder bagbelysningslamperne i skærmen kviksølv.)

Dit product bestaat uit apparatuur die kwikzilver kan bevatten dat moet worden gerecycleerd of moet worden verwijderd volgens de plaatselijke of nationale wetten of de wetten van de staat. (Binnen dit systeem, bevatten de lampen voor de achtergrondverlichting in de monitordisplay kwikzilver.)

Ez a termék részét olyan berendezések képezhetik, amelyek higanyt tartalmaznak, ezt újra kell hasznosítani, vagy a helyi vagy országos rendelkezéseknek megfelelően kell likvidálni. (E rendszerben a monitor képernyőjének a hátsó megvilágítását biztosító lámpák tartalmaznak higanyt.)

Questo prodotto consiste di dispositivi che possono contenere mercurio, da riciclare o smaltire in accordo con le leggi locali, regionali o nazionali. (In questo sistema, le lampade di retroilluminazione nel display del monitor contengono mercurio.)

本製品は有害な水銀を含有している可能性がある機器で構成されているため、国内および地域の関連法規に基づいてリサイクルまたは廃棄処分してください。（このシステムでは、モニターディスプレイのバックライトランプに水銀が含まれています。）

Dette produktet består av utstyr som kan inneholde kvikksølv, som må resirkuleres eller deponeres i samsvar med lokale eller nasjonale lover. (Innenfor dette systemet inneholder baklyslampene i monitordisplayet kvikksølv.)

Ten produkt składa się z urządzeń mogących zawierać rtęć, która musi być poddawana recyklingowi lub składowana zgodnie miejscowym lub krajowym prawem. (Lampy podświetlające w wyświetlaczu monitora zawierają rtęć.)

Este produto incorpora dispositivos que poderão conter mercúrio, devendo ser reciclado ou eliminado de acordo com as leis locais, estatais ou nacionais. (Dentro deste sistema, as lâmpadas de fundo no écran do monitor podem conter mercúrio.)

Данное изделие состоит из устройств, которые могу содержать ртуть, требующую соблюдения соответствующих местных и федеральных законов при повторном использовании и утилизации.(В данной системе ртуть содержится в лампах подсветки монитора.)

Este producto consta de elementos que pueden contener mercurio, los cuales deben reciclarse o gestionarse de acuerdo a las Leyes locales, regionales o estatales (dentro de este sistema, la lámparas de retroiluminación del display del monitor contienen mercurio)

Denna produkt består av komponenter som kan innehålla kvicksilver, vilket måste återvinnas eller bortskaffas i enlighet med lokala eller nationella lagar. (I systemet innehåller lamporna för bakgrundsbelysningen i skärmen kvicksilver.)

Το συγκεκριμένο προϊόν περιλαμβάνει συσκευές που ενδέχεται να περιέχουν υδράργυρο, η ανακύκλωση ή απόρριψη του οποίου πρέπει να πραγματοποιείται σύμφωνα με τον τοπική, πολιτειακή ή εθνική νομοθεσία. (Στο συγκεκριμένο σύστημα, οι λυχνίες οπίσθιου φωτισμού στην οθόνη του μόνιτορ περιέχουν υδράργυρο)

List of abbreviations/acronyms

B

C	
CRT	Cathode Ray Tube
D	
DDC	Display Data Channel
DIN	German Institute for Standardization
DPMS	Display Power Management Signaling
DVI	Digital Visual Interface
DVI-A	Digital Visual Interface - Analog
DVI-D	Digital Visual Interface - Digital
DVI-I	Digital Visual Interface - Integrated
I	
ESD	Electrostatic Discharge
EMC	Electromagnetic compatibility
EN	European standard
F	
FCC	Federal Communications Commission
H	
HF	High Frequency
L	
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LUT	Look Up Table
O	
OSD	On-screen display
S	
SMfit® Total Care	Display QA software
SMPTE	Society for Motion Picture and Television Engineers
SVGA	Super Video Graphics Array
T	
TN-S mains	Terre Neutre–Separé
TFT	Thin Film Transistor
V	
VGA	Video Graphics Array
VESA	Video Electronics Standards Association
X	
XGA	Xtended Graphics Array

Units of measurement:	
Cd/m²	Candela/m² (photometric measurement for brightness)
ftL	3.426 cd/m²

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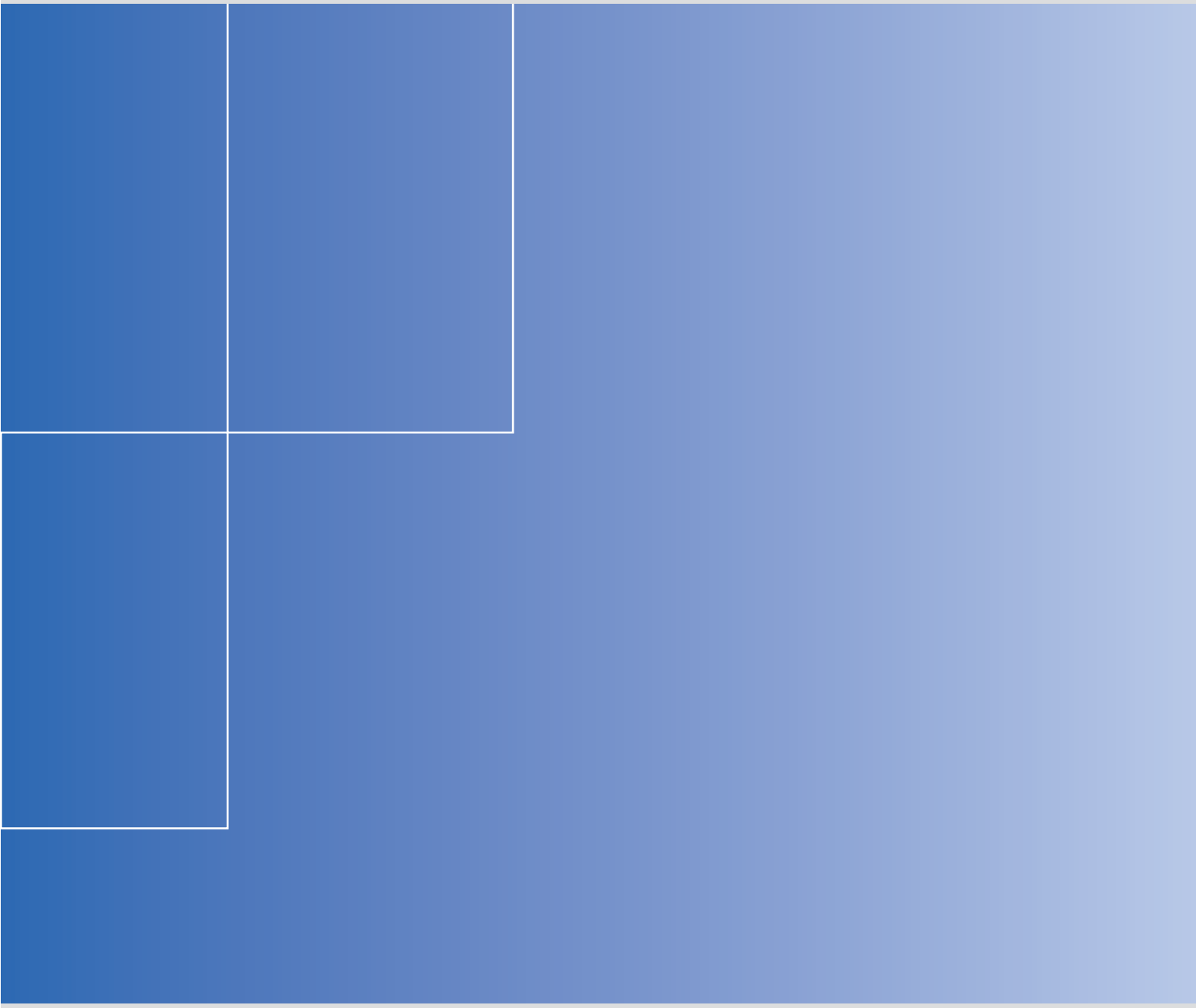

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